

Expert Forum for Producers and Users of Disaster-related Statistics
7,8 and 10 June 2021

Session 1: Disaster Risk Reduction: The role of official statistics

DISASTER-RELATED STATISTICS FRAMEWORK (DRSF)

Expert Group on Disaster-related Statistics in Asia and the Pacific



Disaster-related Statistics Framework (DRSF)

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<https://stat-confluence.escap.un.org/display/TWG/DRSF%3A+Disaster-related+Statistics+Framework>

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I. Rationale

Challenges

Call for improved statistics to strengthen evidence base for DRR

Countries differ in practices for compiling data and statistics related to disasters

Numerous institutions in countries collect disaster-related data, partly uncoordinated

Demand for statistical framework

Improvements to national databases on disaster risk and disaster impacts

Harmonization, comparability and consistency of methods across countries

Bridge between disaster and risk management information with socio-economic statistics

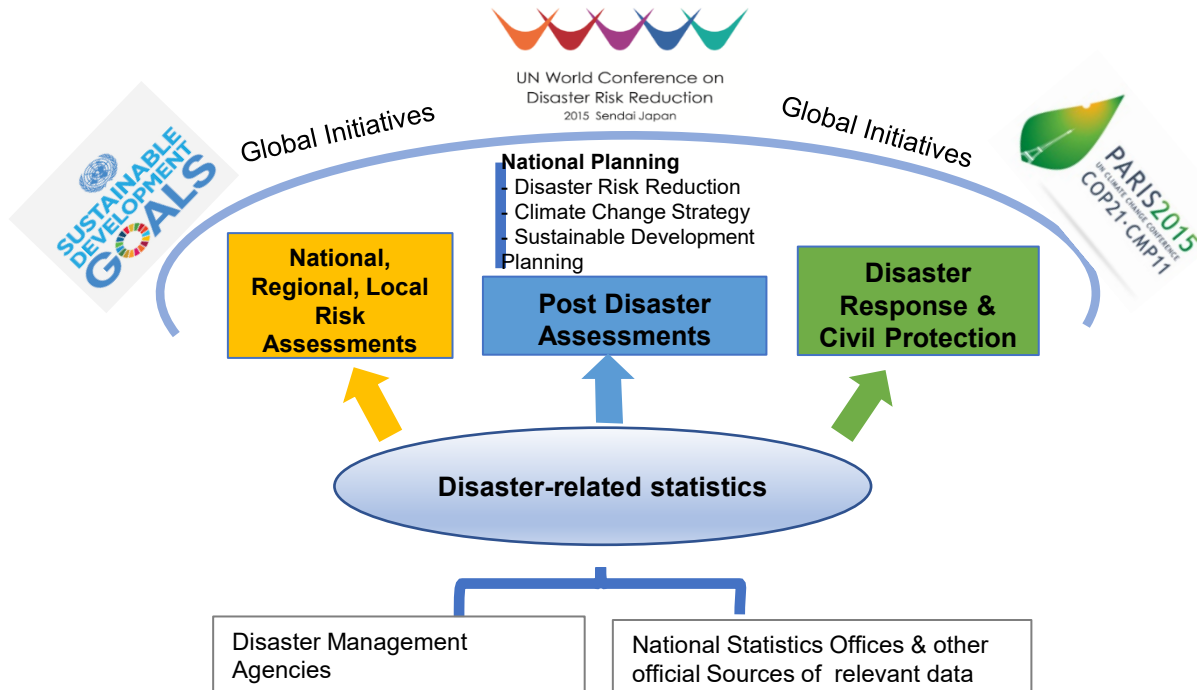
Uses of disaster-related statistics

disaster risk mgt. planning; post-disaster assessment

Compilation of indicators for monitoring; empirical research

form part of the integrated sustainable development policy of the country

I. A. Policy Context



National and international applications for harmonized national disaster-related statistics

II. Why a Statistical Framework?

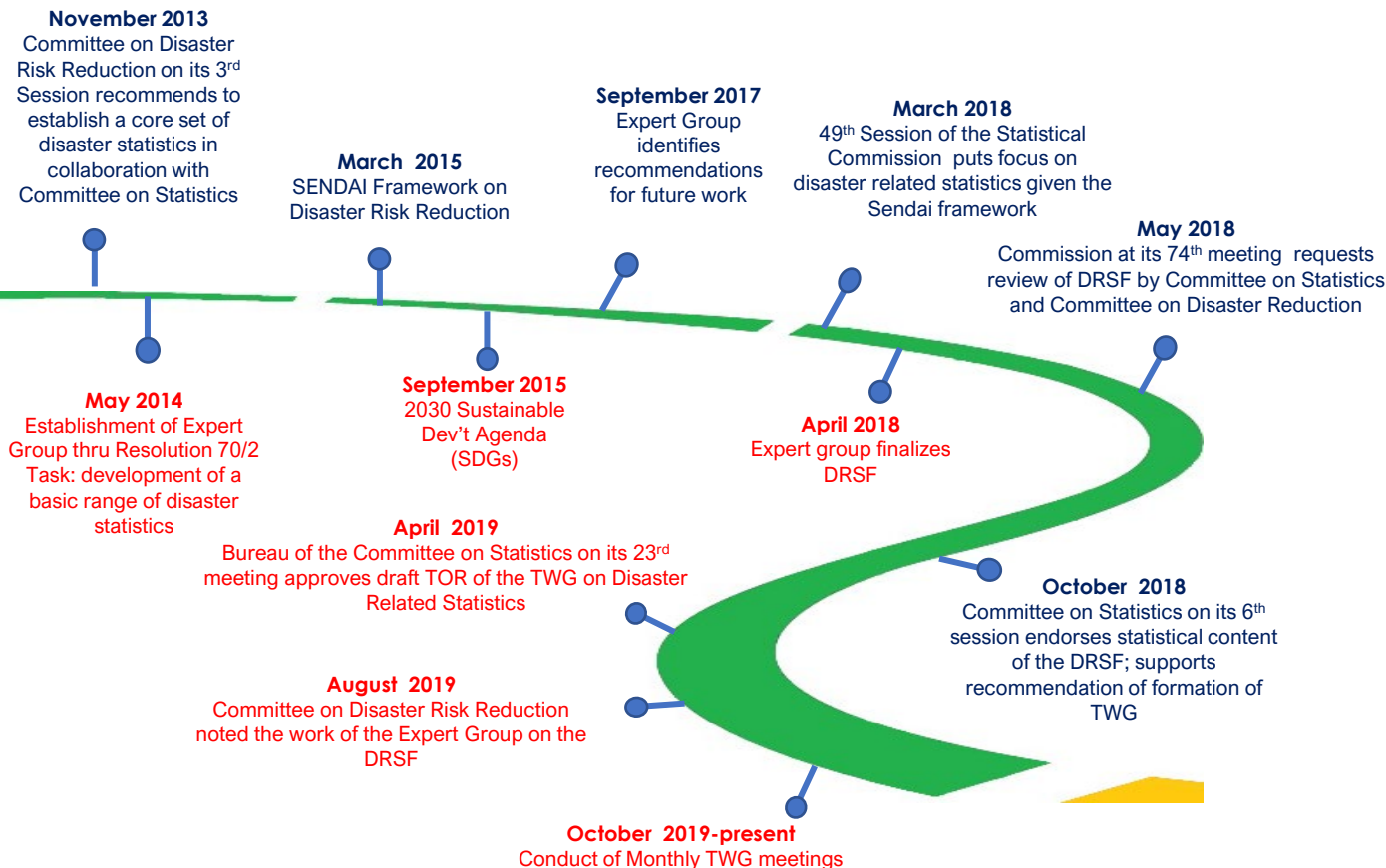
Existing policy platforms –Sendai Framework for Disaster Risk Reduction and SDGs define **WHAT** should be measured to achieve DRR goals and targets.

- Internationally, measurement demands are elaborated in UNISDR Sendai Framework Monitoring Indicators Guidance (UNISDR, 2018)

Role of a statistical framework is HOW to meet above information demands

- a tool for integrating and improving quality of statistics calculated coming from multiple sources and multiple government agencies

III. Timelines: Disaster-related Statistical Framework (DRSF)



IV. Overview of the DRSF

- A set of internally consistent and internationally consistent guidelines on how to develop a common and standardized basic range of disaster-related statistics
- Integrates data and metadata that are usually dispersed across different government agencies to produce relevant information to all phases of disaster risk management:
 - a. disaster preparedness
 - b. risk identification
 - c. response and recovery
 - d. prevention and mitigation

IV. Overview of the DRSF (con't)

- accompanied by implementation tools and resources:
 - a. a set of core tables (reporting templates) covering:
the scope of the basic range of statistics
 - b. descriptions of good practices (case studies)
 - c. contains basic training materials for applying official statistics
to production of key components of disaster related statistics
using Geographic Information Systems (GIS) and other
technologies

IV. A. Contents of the DRSF

Part 1: outlines the conceptual framework for a basic range of disaster-related statistics:

- applying and interpreting the concepts from the Sendai Framework and related references on disaster risk management for the practice of data collection and statistical compilations

Part 2: provides guidance on the following:

- implementation of the framework, including practical steps for organizing data and tools to support the process of national integration
- harmonization across data sources such as classifications, definitions, advice on measurement units
- summary tables as sample compilations of the complete basic range of disaster-related statistics

IV. B. Development Process of the DRSF

Who developed the DRSF	Processes Involved
<ul style="list-style-type: none">• Developed by an Expert Group led by ESCAP, National Statistics Offices, Disaster Mgt. Agencies Agencies in Asia-Pacific; international experts; UN agencies and other international organizations• Brought together expertise on disaster-risk reduction and official statistics for:<ul style="list-style-type: none">- Improved understanding of risks- Improved quality of disaster statistics	<ul style="list-style-type: none">• Method of work: developed through iterative and interactive processes:<ul style="list-style-type: none">- studies of current country practices- pilot studies to test draft recommendations based on real data from national agencies- on-line consultations- expert group meetings- workshops and seminars• Duration of work: 2014-2018

V. A. Contents of the DRSF: Part 1

Conceptual Framework: Basic range of disaster-related statistics

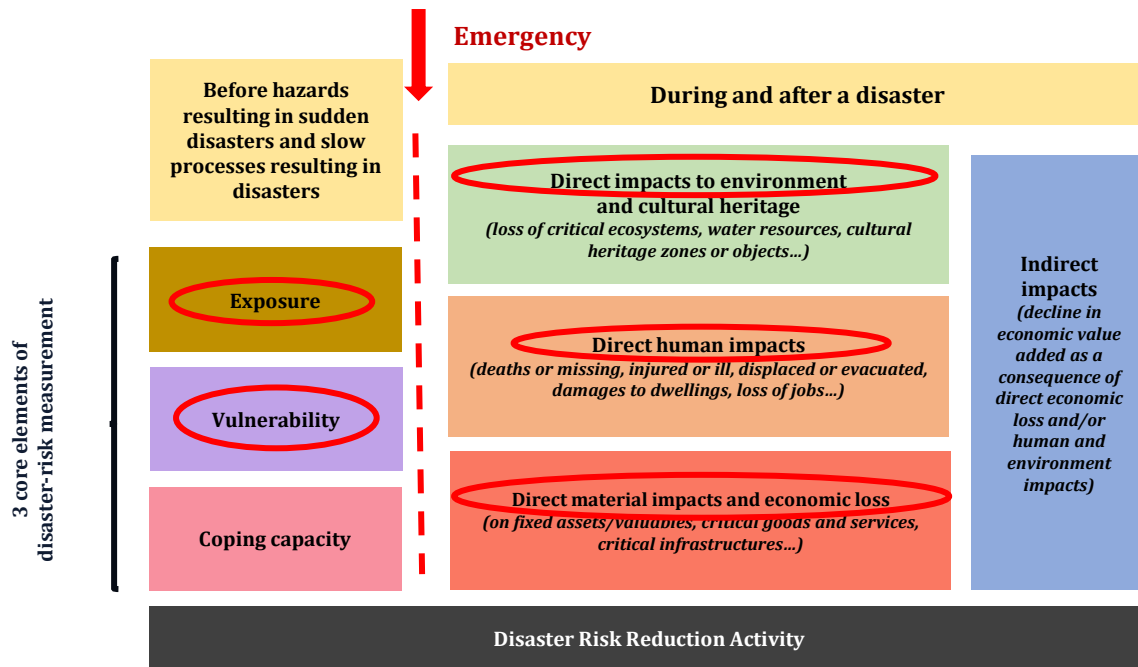


Figure above represents how the basic range of disaster-related statistics is broadly organized in the DRSF

V. A. Contents of the DRSF: Part 1

Basic range of disaster-related statistics: before a disaster

Before a Disaster	Concept	Data/Statistics	Indicators
Risk Assessment	process to determine the nature, extent, and locations of risk, by analysing exposure and conditions of vulnerability to hazards and present coping capacities against all types of disaster impacts.	<ul style="list-style-type: none">• Population density by location• Characteristics of dwellings• Information on assets of households, such as type of dwelling	<ul style="list-style-type: none">• Disaster risk indices• Multi-hazard risk indices
Exposure to Hazards	state of being in which a person or a group of people remain in an imminent risk of danger due to hazards	<ul style="list-style-type: none">• Hazard map• Map of the population, critical infrastructure• Population density• Land cover/Use• HH income	<ul style="list-style-type: none">• Hazard Exposure by geographic regions• Population Exposure by social groups• Exposure of Land and Infrastructure by Hazard Type
Vulnerability	conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.	<ul style="list-style-type: none">• statistics on basic social & demographic characteristics of populations, especially in high risk areas.	<ul style="list-style-type: none">• prevalence of sexual and physical violence and harassment in situations of instability• women's participation in post recovery process

V. A. Contents of the DRSF: Part 1

Basic range of disaster-related statistics: before a disaster (con't)

Before a disaster	Concept	Data/Statistics	Indicators
Coping Capacity	resilience of households, businesses, communities, social-ecological systems, and whole countries against external shocks in the form of a disaster	<ul style="list-style-type: none"> • Disaster preparedness of HH; trainings attended • Early warning systems • Investments in DRR 	<ul style="list-style-type: none"> • Share of HH with emergency plans • Population covered by early warning systems • Share of HH with improved access to water
Disaster risk reduction activity (before a disaster)	Activities aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contributes to strengthening resilience	<ul style="list-style-type: none"> • Expenses on land use planning; early warning systems; emergency management by institutional sector • Production expenses on disaster preparedness; emergency supply by institutional sector 	<ul style="list-style-type: none"> • Activity expenditure and investment in disaster risk prevention and mitigation • Current production expenditure on disaster management

V. A. Contents of the DRSF: Part 1

Basic range of disaster-related statistics: during and after a disaster

During & after a Disaster	Concept	Data/Statistics	Indicators
<p>Direct impacts: (economic loss)</p> <p>- to environment and cultural heritage</p>	<p>Physical damage happening during or shortly following a disaster directly triggered by a hazard.</p> <p>damage to land and other natural resources, ecosystems</p>	<ul style="list-style-type: none">• Area of agricultural plantation destroyed• Area of urban and dev't area destroyed• Area of cultural heritage sites destroyed	<ul style="list-style-type: none">• Effect of disasters on GDP• Damage to ecosystems by land cover type• Damage to natural water resources• Damage to the atmosphere
<p>- human impacts</p>	<p>Loss of lives; personal injury and illness; displacement of people due to disasters</p>	<ul style="list-style-type: none">• hazard type by geographic region• No. of deaths, injured, displaced, loss of jobs• No. of persons evacuated; received aid	<ul style="list-style-type: none">• human impacts by hazards types and geographic regions• affected human, population by demographic & social categories
<p>- material impacts</p>	<p>Damages to buildings and structures; machinery</p>	<ul style="list-style-type: none">• Dwellings, buildings and structures destroyed• damage to critical infrastructure (roads, bridges, dams)	<ul style="list-style-type: none">• direct material and agricultural impacts by hazards types and geographical region• Disruption of basic services by hazard type and geographical region

V. A. Contents of the DRSF: Part 1

Basic range of disaster-related statistics: during and after a disaster

During and after a Disaster	Concept	Data/Statistics	Indicators
Indirect impacts (indirect economic loss)	Consequences of a disaster to the economy or other social conditions for which causality is not directly observed	<ul style="list-style-type: none">• time series statistics on: hazards; population and housing; economic activities from business surveys	<ul style="list-style-type: none">• Loss of livelihood• Disruption of basic services as a consequence of disasters
Disaster risk reduction activity (during and after a disaster)	aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contributes to strengthening resilience	<ul style="list-style-type: none">• Expenditures on relocation, rehabilitation and construction by institutional sector• Government expenditure for disaster risk reduction• Public transfers to private	<ul style="list-style-type: none">• Production expenditure on disaster recovery'• Research & dev't, education expenditure• Disaster-reduction transfers paid

V. B. Contents of the DRSF: Part 2 Implementation Framework

Basic steps for implementation

1. Establish an institutional environment for official disaster-related statistics: Checklist:

Step 1– Create an enabling environment for disaster risk reduction

Step 2 – Find an appropriate 'home' for the database

Step 3 – Integrate use of official statistics for design and monitoring of national disaster risk reduction strategies

Step 4 – Collect, enter and validate data

Step 5 – Conduct analysis, manage data and ensure sustainability

2. Institutional arrangements:

- National Statistical Offices (NSOs) are responsible to promote national statistical quality aligned with the Fundamental Principles of Official Statistics by enforcing methodological standards, while NDMAs coordinate and lead the implementation of disaster risk management

V. B. Contents of the DRSF: Part 2 Implementation Framework

Basic steps for implementation

3. Statistical coordination

- detailed mapping of existing sources of data, conceptual harmonization
- Establish roles and responsibilities among agencies
- establish a multi-agency technical working group

4. Use of GIS

- indispensable tool for producing and analyzing disaster-related statistics and for their use in disaster risk reduction

5. Prioritization:

- identify and adopt priorities for statistical development for current priority policies and expected uses for decisionmakers

6. Development of Technical Standards

- establish standards for developing the databases for harmonization and consistency in the variables over time
- adopt common definitions; glossary of hazard types (for statistical purposes), classification systems and standards for measurement units

V. B. Contents of the DRSF: Part 2

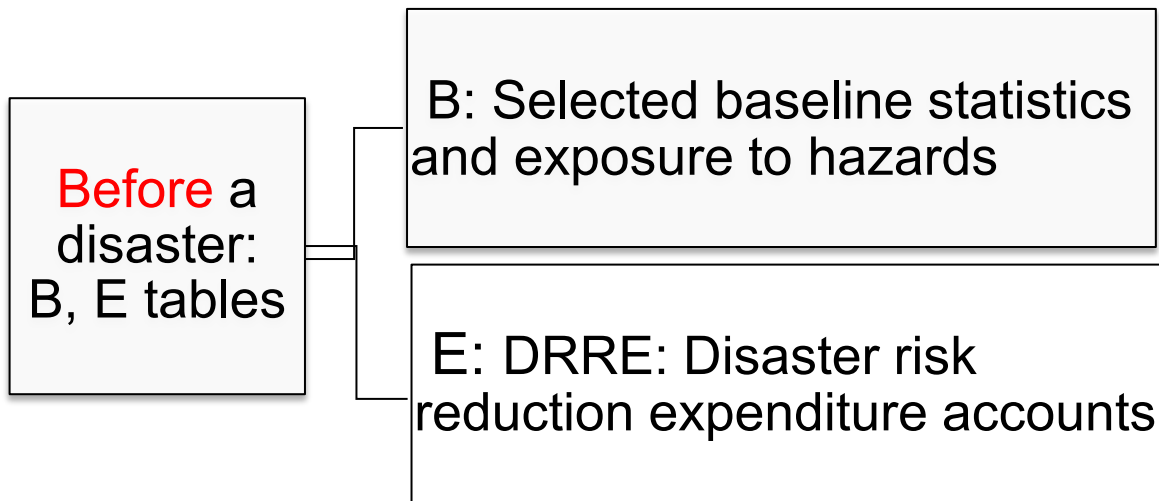
Implementation framework: Summary of statistics tables

- Basic templates for extracting statistics from the underlying databases in line with the recommendations of the DRSF for the basic range of disaster-related statistics.
- was developed based on pilot studies and extensive discussions by the Expert Group
- Most of the statistics in the basic range are compatible with GIS, i.e., variables are associated with a standardized system of geo-referenced coding

Link to the complete DRSF statistical tables:

[*DRSF: Disaster-related Statistics Framework - Technical Working Group on Disaster-related Statistics in Asia and the Pacific \(TWG\) - Asia-Pacific Statistical Communities Of Practice*](#)

Implementation framework: Summary of statistics tables (con't)



B tables are for assessing hazard exposure statistics, which are compiled prior to disaster occurrences, and updated over time according to the relevant categories (hazard types and geographic zonings); the DRRE provides the background statistics on coping capacity and resilience

Implementation framework: Summary of statistics tables (con't)

Example of B tables: Table B1a: Population Background Statistics and Hazard Exposure by geographic regions

For each disaster occurrence, there are at least three characteristics of the event that should be recorded: hazard type, scale and geographic region

		REGION					Measurement Unit
		Geo. Region 1	Geo. Region 2	Geo. Region 3	1	NATIONAL TOTAL	
1	Population	SDG 1.5.1, Sendai A1,B1	SDG 1.5.1, Sendai A1,B1	SDG 1.5.1, Sendai A1,B1	SDG 1.5.1, Sendai A1,B1	SDG 1.5.1, Sendai A1,B1	No. of people
1.1	Children under 5 years						No. of people
1.2	Persons over 60 years						No. of people
1.3	Persons with disabilities						No. of people
2	Households						No. of households
3	Median Households disposable income						currency
3.1	Local currency (NAME...)						currency
3.2	US\$ PPP						US\$ PPP
4	GDP	SDG 1.5.2	SDG 1.5.2	SDG 1.5.2	SDG 1.5.2	SDG 1.5.2	currency
4.1	Local currency (NAME...)						currency
4.2	US\$ PPP						US\$ PPP
5	Population in Hazard Area						No. of people
5.1	Geophysical						
5.1.1	High exposure						No. of people
5.1.2	Moderate exposure						No. of people
5.1.3	Low exposure						No. of people
5.2	Hydrological						
5.2.1	High exposure						No. of people
5.2.2	Moderate exposure						No. of people
5.2.3	Low exposure						No. of people
5.3	Meteorological & Climatological						
5.3.1	High exposure						No. of people
5.3.2	Moderate exposure						No. of people
5.3.3	Low exposure						No. of people
5.4	Other (specify)						
5.4.1	High exposure						No. of people
5.4.2	Moderate exposure						No. of people
5.4.3	Low exposure						No. of people

Data sources: Joint work of NSO and NDMA, background statistics derived from NSO and from national accounts; exposure to hazards calculated by NDMA

Links to global indicators: Number of deaths attributed to disasters, per 100,000 population

Exposure is measured according to hazard area maps, produced using a variety of physical data inputs (see Chapter 2). Hazard maps are overlaid with social and economic statistics to estimate exposure. The ranking (high, moderate, low) refer to hazard probabilities - for example flood hazards are usually higher closer to the sources and depending on the slope and features of the terrain. The hazard may exist at lower probabilities, further away.

Implementation framework: Summary of statistics tables (con't)

Table DRRE_A: Production expenditure account (current plus investment) by characteristic activities by local currency

The DRRE tables are based on the standards and formats of the SNA to align with the broader aggregated accounting framework for the whole economy.

Risk analyses can benefit from comparisons between investment within the categories of DRR activities, like post-disaster reconstruction expenditures and post-disaster “structural measures” for future disaster prevention, e.g. building back better.

	Providers of disaster risk reduction services (SNA institutional sectors)										TOTAL Production expenditure (sum of rows 10 to 14)	Total of the World (2019)	
	Non-financial corporations (A)	Financial corporations (B)	General government (incl. non-profit institutions controlled by governments and social security)				Households			Nonprofit institutions without household liabilities			
			Central government (G1)	State government (G2)	Local government (G3)	Subtotal General government (G)	House- hold net income (HH1)	Employ- ment net income (HH2)	Subtotal Household (HH)				
Activity expenditure account (current plus investment)													
1 Disaster Risk Prevention													
1.1 Risk prevention in advance of hazardous event													
1.2 Risk prevention in or after hazardous event													
2 Disaster Risk Mitigation													
2.1 Structural measures													490,154.1
2.2 Non-structural measures													
2.3 Land-use planning													
2.4 Early warning systems management													
3 Disaster Management													
3.1 Preparedness													
3.2 Emergency management													
3.3 Other disaster responses													
3.4 Emergency supply of commodities													
4 Disaster Recovery													
4.1 Relocation													
4.2 Rehabilitation													
4.3 Reconstruction													
5 General Government, Research & Development, Education Expenditure													
5.1 General government expenditure for Disaster Risk Reduction													
5.2 Research & Development, risk assessment, and information													
5.3 Education to Disaster Risk Reduction													
A Subtotal current production expenditure (SUM 1 to 14)													
1 Disaster Risk Prevention													
1.1 Risk prevention in advance of hazardous event													
1.2 Risk prevention in or after hazardous event													
2 Disaster Risk Mitigation													
2.1 Structural measures													
2.2 Non-structural measures													
2.3 Land-use planning													
2.4 Early warning systems management													
3 Disaster Management													
3.1 Preparedness													
3.2 Emergency management													
3.3 Other disaster responses													
3.4 Emergency supply of commodities													
4 Disaster Recovery													
4.1 Relocation													
4.2 Rehabilitation													
4.3 Reconstruction													
5 General Government, Research & Development, Education Expenditure													
5.1 General government expenditure for Disaster Risk Reduction													
5.2 Research & Development, risk assessment, and information													
5.3 Education to Disaster Risk Reduction													
B Subtotal Gross formation of fixed capital (SUM 1 to 16)													
1 Acquisition less disposals of land and other non-produced non-financial assets													
1.1 Acquisition less disposals of land													
1.2 Acquisition less disposals of non-produced non-financial assets													
C Investment production expenditure													
Total DRRE Production Expenditure (current plus investment)													

Implementation framework: Summary of statistics tables (con't)

Table DRRE_B: Transfers expenditure account & DRR National Expenditure (local currency)

This table aims to identify the portions of activities with a primary disaster risk reduction purpose.

Non-Financial operations	Financial operations	Institutional sector							TOTAL	TOTAL	BENEFICIARIES (thousands)		
		General government (not including public corporations controlled by government and social security)				Households						Non-profit organizations (NPOs)	TOTAL sector (with 4 year of activity)
		Central government	State government	Local government	Subtotal General government	Households owned by micro, small and medium enterprises	EMPLOYED self-employed in agriculture, forestry and fisheries	Household					
Transfers expenditure account													
Total Transfers Paid (6.1)													
6.1 Disaster risk reduction characteristic transfers paid													
6.1.1 Internal transfers between public government services (current or in capital)													
6.1.2 Risk transfers, insurance premiums and indemnities													
6.1.3 Disaster related international transfers (current or in capital)													
6.1.4 Public transfers to private (subsidies, transfers in capital...)													
6.1.5 Private transfers (axes voluntary...)													
6.1.6 Other transfers													
Total Transfers Received (6.2)													
6.2 Disaster risk reduction characteristic transfers received													
6.2.1 Internal transfers between public government services (current or in capital)													
6.2.2 Risk transfers, insurance premiums and indemnities													
6.2.3 Disaster related international transfers (current or in capital)													
6.2.4 Public transfers to private (subsidies, transfers in capital...)													
6.2.5 Private transfers (axes voluntary...)													
6.2.6 Other transfers													
DRR Net transfers (6.1 minus 6.2)													
Total DRR Production Expenditure (current plus investment)													
DRR National Expenditure = Total Production Expenditure plus Net Transfers													
Benefits of the DRR National expenditure (by beneficiaries)													
Beneficiaries of the total Production Expenditure													
Beneficiaries of Total Transfers Received													

Implementation framework: Summary of statistics tables (con't)

During a
disaster:
Tables A,
C, D

A: Summary tables of disaster occurrences

C: Summary tables of human impacts

D: Summary tables of direct material impacts in physical terms

Implementation framework: Summary of statistics tables (con't)

Example of A tables: Table A1: Summary table of disaster occurrences

For each disaster occurrence, there are at least three characteristics of the event that should be recorded: hazard type, scale and geographic region

A1 Summary table of disaster occurrences, by hazards types, scale, and geographic region
Measurement units: counts of occurrences

	Geo Region 1				Geo Region 2				Geo Region 3				...				Adjustment for multiple counting of events by regions/states (-)				Adj. National total					
	Large	Medium	Small (Local scale)	Total	Large	Medium	Small (local scale)	Total	Large	Medium	Small (Local scale)	Total	Large	Medium	Small (Local scale)	Total	Large	Medium	Small (Local scale)	Total	Very large events	National scale medium to large events	Small (Local scale)	Total		
Geo-physical																										
Hydrological																										
Meteorological & Climatological																										
Biological																										
Other																										
Total																										

Implementation framework: Summary of statistics tables (con't)

Example of C tables

Table C1: Summary table of human impacts by hazards types

Some data and statistics relate to both human and material categories. For example, the same data sources that are used for accounting for damaged or destroyed dwellings (Sendai Framework Target C for economic loss) should also be applicable for estimating the number of people whose houses were damaged (Sendai Framework Target B for affected population).

		HAZARDS					NATIONAL TOTAL
		Geo-physical	Hydrological	Meteorological & Climatological	Biological	Other	
1 - Summary of Human Impacts							
Human, affected population							
1.1	Deaths or missing	SDG 1.5.1/Sendai A-	SDG 1.5.1/Sendai A-	SDG 1.5.1/Sendai A-	SDG 1.5.1/Sendai A-	SDG 1.5.1/Sendai A-	SDG 1.5.1/Sendai A-
1.1.1	Deaths	Sendai A-2	Sendai A-2	Sendai A-2	Sendai A-2	Sendai A-2	Sendai A-2
1.1.2	Missing	Sendai A-3	Sendai A-3	Sendai A-3	Sendai A-3	Sendai A-3	Sendai A-3
1.2	Injured or ill	Sendai B-2	Sendai B-2	Sendai B-2	Sendai B-2	Sendai B-2	Sendai B-2
1.2.1	Major injuries						
1.2.2	Minor injuries						
1.2.3	Amesses						
1.3	Displaced						
1.3.1	Permanent relocations due to destroyed dwelling	Sendai B-4	Sendai B-4	Sendai B-4	Sendai B-4	Sendai B-4	Sendai B-4
1.3.2	Other Displaced						
1.4	Dwellings Damaged						
1.4.1	Number of people whose houses were damaged due to hazardous events	Sendai B-3	Sendai B-3	Sendai B-3	Sendai B-3	Sendai B-3	Sendai B-3
1.5	Loss of Jobs/occupations						
1.5.1	Direct losses of jobs/occupations in industry and services	Sendai B-5	Sendai B-5	Sendai B-5	Sendai B-5	Sendai B-5	Sendai B-5
1.5.2	Direct losses of jobs/occupations in agriculture						
1.5.3	Losses of days of activity						
1.5.3.1	Direct losses of days of activity in agriculture						
1.5.3.2	Direct losses of days of activity in industry and services						
1.6	Number of people evacuated or receiving aid						
1.6.1	Number of people who received aid, including food and non-food aid during a disaster						
1.6.2	Supported with evacuation						
1.6.3	Non-supported evacuations						
1.6.4	Number of people who received aid after a disaster						
1.7	Otherwise affected						
1.8	Total Human Impacts (no of impacts)	SDG 1.5.1/Sendai B-	SDG 1.5.1/Sendai B-	SDG 1.5.1/Sendai B-	SDG 1.5.1/Sendai B-	SDG 1.5.1/Sendai B-	SDG 1.5.1/Sendai B-
1.9	Multiple counts, individuals (minus)						
1.10	Total Human Impacts (no of people)						

Variables 1.4 and 1.3.3 based on measurement of damage and destruction to dwellings (material impacts tables)

Multiple counts is an adjustment for aggregation in terms of number of people (instead of number of impacts), see Chapter 6 for further explanation.

Implementation framework: Summary of statistics tables (con't)

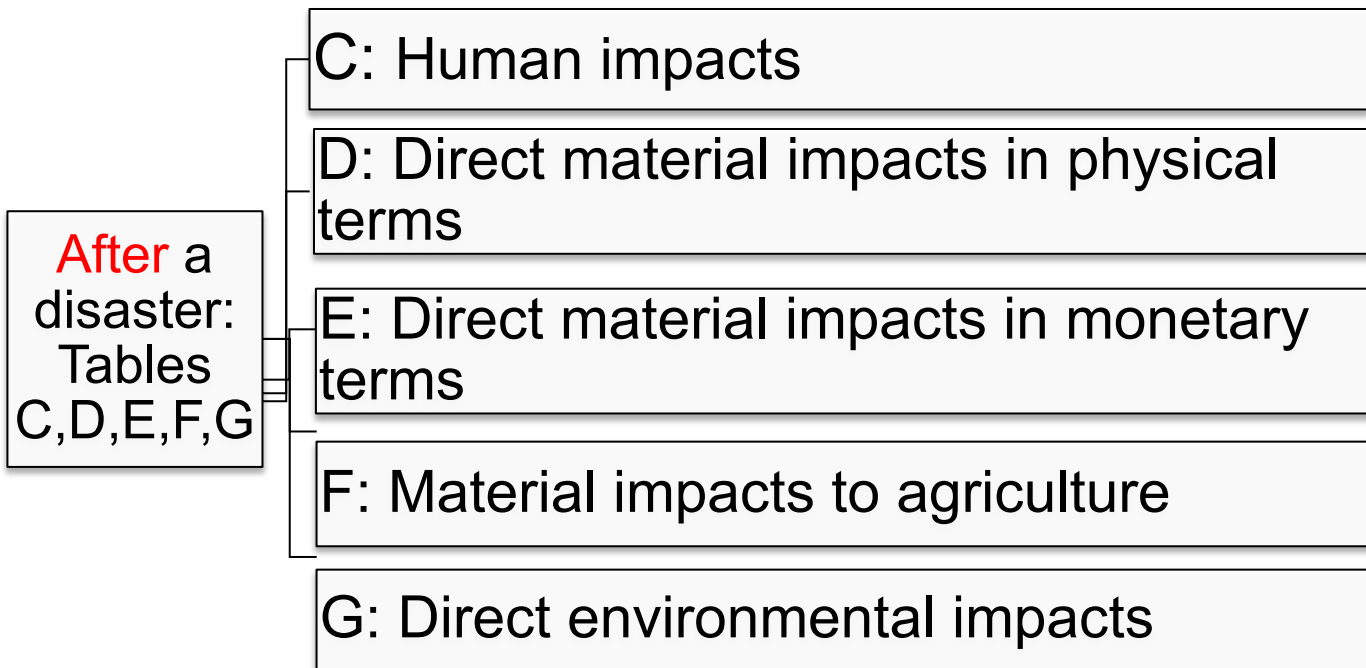
Example of D tables Table D1a: Summary table of direct material impacts by hazards types

Direct observations of material impacts from a disaster are initially compiled in physical terms, for example area affected or counts of units or buildings that are damaged or destroyed. The impacts can also be represented in relation to the numbers of people exposed or affected. This includes, where possible, disaggregated statistics, e.g. by gender or by income categories

		hazard types						Measurement unit
		Seismic	Hydrological	Metereological & Climatological	Biological	Other	TOTAL	
Direct economic material impacts								
1-Direct impacts on fixed assets or consumer durables								
1.1	Dwellings (number)							no. of units
1.1.1	Dwellings destroyed (number)							no. of units
1.1.2	Dwellings damaged (number)							no. of units
1.2	Buildings and structures							sq. km
1.2.1	Critical buildings & structures	Sensid-D-1	Sensid-D-4	Sensid-D-4	Sensid-D-4	Sensid-D-4	Sensid-D-4	sq. m
1.2.2	Other building and structures							sq. m
1.3	Machinery and equipment							no. of units
1.3.1	Critical machinery and equipment	Sensid-D-4	Sensid-D-4	Sensid-D-4	Sensid-D-4	Sensid-D-4	Sensid-D-4	no. of units
1.3.2	Other machinery and equipment							no. of units
1.4	Consumer Durables							no. of units
2-Direct impacts on valuables (SNA asset definition)								
2.1	Art objects, music instruments							no. of units
2.2	Other valuables							no. of units
3-Natural resources								
3.1	Land, incl. soil							sq. km
3.2	Agriculture land							sq. km
3.3	Forest forests							sq. km
3.4	Livestock							no. of units
3.5	Fish stocks							sq. km
3.6	Freshwater							sq. km
3.7	Other nature resources							sq. km
4-Critical goods & services								
4.1	Foodstuffs (SNA asset definition)							tons
4.1.1	Agriculture (incl. immature crops)							tons
4.1.2	Manufacture, other products							tons
5-Critical infrastructures (1, 2, 1)								
5.1	Hospitals, health facilities	Sensid-D-2	Sensid-D-2	Sensid-D-2	Sensid-D-2	Sensid-D-2	Sensid-D-2	no. of units
5.2	Education facilities	Sensid-D-1	Sensid-D-3	Sensid-D-3	Sensid-D-3	Sensid-D-3	Sensid-D-3	no. of units
5.3	Other critical public administration buildings	Sensid-D-4	Sensid-D-4	Sensid-D-4	Sensid-D-4	Sensid-D-4	Sensid-D-4	no. of units
5.4	Public monuments							no. of buildings
5.4.1	Religious buildings							no. of buildings
5.5	Roads							km
5.6	Bridges							no. of units
5.7	Rail stations							km
5.8	Dams							no. of units
5.9	Piers							no. of units
5.10	Transport equipments							no. of units
5.11	Electricity generation facilities							no. of units
5.12	Electricity grids							no. of units
5.13	IT Equipments							no. of units
5.14	Docks							no. of units
5.15	Water supply infrastructure							no. of units
5.16	Water sewer & wastewater systems							no. of units
5.17	Other critical infrastructures (specify)							no. of units
6-Direct impact on cultural heritage								
6.1 Direct impact on cultural heritage zones								
6.1.1	UNESCO cultural heritage sites							sq. km
6.1.2	National cultural heritage designations							sq. km
6.1.3	Urban heritage							sq. km
6.1.4	Other heritage designations							sq. km
6.2 Direct impact on cultural heritage objects								
6.2.1	Buildings and monuments							no. of units
6.2.2	Culture heritage valuables (2)							no. of units
6.2.3	Other culture heritage (please specify)							no. of units

For definitions see Material Impacts Classification in Chapter 8
Distinguishing between damaged or destroyed is feasible for all variables and may be reported depending on demand. For the case of dwellings destroyed dwellings results in displacement whereas a damaged dwelling might be repaired without displacement.

Implementation framework: Summary of statistics tables (con't)



Implementation framework: Summary of statistics tables (con't)

- C tables are for compiling data related to affected populations (impacts on people);
- D tables are used for recording direct material impacts in "physical" terms, such as area of damages or number of buildings, by categories;
- E tables are for recording the impacts in monetary values, when it is relevant and possible, to calculate the direct economic losses, aligned with the Sendai Framework definition;
- F Tables is in alignment with requirements for Sendai Framework monitoring and for presentation in DRSF; and
- G tables extend the compilations on direct material impacts to include impacts to the environment.

Implementation framework: Summary of statistics tables (con't)

Example of C tables: Table C3: Summary table of affected population by demographic and social categories

Disaggregated statistics on people affected by disasters are compiled for a full understanding of post-disaster recovery needs and for use in future risk assessment

	C3a1 - Age groups				TOTAL	C3a2 - Sex			TOTAL	C3a3 - Urban/Rural population			TOTAL	C3a4 - Specific vulnerability groups		NO TOTAL
	0-9	10-19	20-64	65+		Male	Female			Urban	Rural			Disabled	Rural	
1 - Summary of Human Impacts																
Human affected population																
1.1	Deaths or missing	SDG 1.5.1/ Sendai A-1	SDG 1.5.1/ Sendai A-1	SDG 1.5.1/ Sendai A-1	SDG 1.5.1/ Sendai A-1	SDG 1.5.1/ Sendai A-1	SDG 1.5.1/ Sendai A-1	SDG 1.5.1/ Sendai A-1	SDG 1.5.1/ Sendai A-1	SDG 1.5.1/ Sendai A-1	SDG 1.5.1/ Sendai A-1	SDG 1.5.1/ Sendai A-1	SDG 1.5.1/ Sendai A-1	SDG 1.5.1/ Sendai A-1	SDG 1.5.1/ Sendai A-1	SDG 1.5.1/ Sendai A-1
1.1.1	Deaths	Sendai A-2	Sendai A-2	Sendai A-2	Sendai A-2	Sendai A-2	Sendai A-2	Sendai A-2	Sendai A-2	Sendai A-2	Sendai A-2	Sendai A-2	Sendai A-2	Sendai A-2	Sendai A-2	Sendai A-2
1.1.2	Missing	Sendai A-3	Sendai A-3	Sendai A-3	Sendai A-3	Sendai A-3	Sendai A-3	Sendai A-3	Sendai A-3	Sendai A-3	Sendai A-3	Sendai A-3	Sendai A-3	Sendai A-3	Sendai A-3	Sendai A-3
1.2	Injured or ill	Sendai B-2	Sendai B-2	Sendai B-2	Sendai B-2	Sendai B-2	Sendai B-2	Sendai B-2	Sendai B-2	Sendai B-2	Sendai B-2	Sendai B-2	Sendai B-2	Sendai B-2	Sendai B-2	Sendai B-2
1.2.1	Major injuries															
1.2.2	Minor injuries															
1.2.4	Illnesses															
1.3	Displaced															
1.3.1	Permanent relocations due to destroyed dwelling	Sendai B-4		Sendai B-4	Sendai B-4	Sendai B-4	Sendai B-4	Sendai B-4	Sendai B-4	Sendai B-4	Sendai B-4	Sendai B-4	Sendai B-4	Sendai B-4	Sendai B-4	Sendai B-4
1.3.2	Other displaced															
1.4	Dwellings Damaged															
1.4.1	Number of people whose houses were damaged due to hazardous events	Sendai B-3		Sendai B-3	Sendai B-3	Sendai B-3	Sendai B-3	Sendai B-3	Sendai B-3	Sendai B-3	Sendai B-3	Sendai B-3	Sendai B-3	Sendai B-3	Sendai B-3	Sendai B-3
1.5	Loss of jobs/occupations															
1.5.1	Direct losses of jobs/occupations in industry and services	Sendai B-5		Sendai B-5	Sendai B-5	Sendai B-5	Sendai B-5	Sendai B-5	Sendai B-5	Sendai B-5	Sendai B-5	Sendai B-5	Sendai B-5	Sendai B-5	Sendai B-5	Sendai B-5
1.5.2	Direct losses of jobs/occupations in agriculture															
1.5.3	Losses of days of activity															
1.5.3.1	Direct losses of days of activity in agriculture															
1.5.3.2	Direct losses of days of activity in industry and services															
1.6	Number of people evacuated or receiving aid															
1.6.1	Number of people who received aid, including food and non-food aid during a disaster															
1.6.2	Supported with evacuations															
1.6.3	Non-supported evacuations															
1.6.4	Number of people who received aid after a disaster															
1.7	Otherwise affected															
1.8	Affected Population (no of impacts)	SDG 1.5.1/ Sendai B-1		SDG 1.5.1/ Sendai B-1	SDG 1.5.1/ Sendai B-1	SDG 1.5.1/ Sendai B-1	SDG 1.5.1/ Sendai B-1	SDG 1.5.1/ Sendai B-1	SDG 1.5.1/ Sendai B-1	SDG 1.5.1/ Sendai B-1	SDG 1.5.1/ Sendai B-1	SDG 1.5.1/ Sendai B-1	SDG 1.5.1/ Sendai B-1	SDG 1.5.1/ Sendai B-1	SDG 1.5.1/ Sendai B-1	SDG 1.5.1/ Sendai B-1
1.9	Multiple counts, individuals (minus)															
1.10	Total Human Impacts (no of people)															

Urban and rural designations according to national definitions
 Designation for "sex" according to national poverty line (or, if unavailable, World Bank global absolute poverty line)
 Multiple counts is an adjustment for aggregation in terms of number of people (instead of number of impacts); see Chapter 6 for further explanation.

Implementation framework: Summary of statistics tables (con't)

Example of E tables
Table E1b: Summary table of direct material impacts by hazards types and geographic regions (estimated cost of damages in national currency)

The monetary values compilations normally requires a combination of data sources for estimating costs of damages based on average per unit values, including insurance claims assessments, assessments for cost of reconstruction, the recorded values of assets prior to a disaster, records of actual transactions for recovery of damages and average costs of crops or other exposed assets.

	Region 1	Region 2	Region 3	Region 4	Measurement unit: national currency of disaster-affected country (or US\$)	Millions of USD
1-Direct impacts on fixed assets or structures durables						
1.1 Buildings (number)	Sendai C-4	Sendai C-4	Sendai C-4	Sendai C-4		Sendai C-4
1.1.1 Dwellings destroyed (number)						
1.1.2 Dwellings damaged (number)						
1.2 Buildings and structures						
1.2.1 Other buildings & structure	Sendai C-5	Sendai C-5	Sendai C-5	Sendai C-5		Sendai C-5
1.2.2 Other buildings and structure	Sendai C-3	Sendai C-3	Sendai C-3	Sendai C-3		Sendai C-3
1.3 Machinery and equipment						
1.3.1 Critical machinery and equipment	Sendai C-5	Sendai C-5	Sendai C-5	Sendai C-5		Sendai C-5
1.3.2 Other machinery and equipment						
1.4 Capital other durables						
2-Direct impacts on vulnerabilities (SNA asset de Brition)						
2.1 Intangible assets and structures						
2.2 Other intangibles						
3-Natural resources						
3.1 Land, incl. soil						
3.2 Agricultural land	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2		Sendai C-2
3.3 Primary forests						
3.4 Livestock						
3.5 Fish stocks						
3.6 Fisheries						
3.7 Other natural resources						
4-Critical infrastructures (1.2.1)						
4.1 Transport facilities	Sendai C-5	Sendai C-5	Sendai C-5	Sendai C-5		Sendai C-5
4.1.1 Airports, seaports, harbours, ferries, ropeways or cable cars						
4.2 Education facilities						
4.3 Other critical public administration buildings						
4.4 Public monuments						
4.4.1 Religious buildings						
4.4.2 Museums						
4.4.3 Cemeteries						
4.4.4 Markets						
4.4.5 Parks						
4.4.6 Transport terminals						
4.4.7 Electricity distribution facilities						
4.4.8 Gas pipelines						
4.4.9 Pipelines						
4.4.10 Water supply infrastructure						
4.4.11 Sewerage and wastewater systems						
4.4.12 Other critical infrastructure	Sendai C-5	Sendai C-5	Sendai C-5	Sendai C-5		Sendai C-5
5-Reconstruction costs for direct impact on cultural heritage	Sendai C-6	Sendai C-6	Sendai C-6	Sendai C-6		Sendai C-6
6-Other direct costs associated with disaster recovery (e.g. emergency medical services)						
7-Total Direct Economic Loss (1.1-1.3 + 2 + 3 + 4)	SDG 1.5.2, Sendai C-1	SDG 1.5.2, Sendai C-1	SDG 1.5.2, Sendai C-1	SDG 1.5.2, Sendai C-1		SDG 1.5.2, Sendai C-1
<small>Measurement unit: national currency (estimated cost of damages). Monetary values for costs of material impacts normally requires a combination of data sources, particularly insurance claims assessments or assessments for cost of reconstruction, the recorded value of assets prior to a disaster (where available), records of actual transactions for recovery of damages, i.e. expenditure on post-disaster reconstruction, and average costs of crops or other exposed assets for estimating costs of damages based on average per unit values.</small>						

Implementation framework: Summary of statistics tables (con't)

Example of F tables Table F: Summary of material impacts to Agriculture by hazards types

Table F was developed by FAO. It describes the key components of the damage and loss assessment methodology for agriculture:

- Damage: total or partial destruction of physical assets
- Loss: changes in economic flows arising from a disaster

	Hazard types						Allocation units
	Geophysical	Hydrological	Mineralogical & Climatological	Biological	Other	TOTAL	
I-Crops							
11 Area affected by type	SDG 1.5.2, Sendai C-2	SDG 1.5.2, Sendai C-2	SDG 1.5.1, Sendai C-2	SDG 1.5.2, Sendai C-2	SDG 1.5.2, Sendai C-2	SDG 1.5.1, Sendai C-2	hectares
12 Total production loss	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	tonnes
13 Total input increase	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	tonnes
14 Equipment/facilities destroyed	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	units
15 Estimated value of production loss and replanting							currency
16 Total clear shelter for national accounts							currency
II-Livestock							
21 Number of animals killed	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	animals
22 Total production loss and reduction in output	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	tonnes
23 Equipment/facilities destroyed	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	units
24 Estimated value of livestock products from one animal unit (LU) lost							currency
25 Total clear shelter for national accounts							currency
III-Forestry							
31 Area damaged or destroyed	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	hectares
32 Total wood volume destroyed	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	tonnes
IV-Aquaculture							
41 Production from land-based ponds	SDG 1.5.2, Sendai C-2	SDG 1.5.2, Sendai C-2	SDG 1.5.1, Sendai C-2	SDG 1.5.2, Sendai C-2	SDG 1.5.2, Sendai C-2	SDG 1.5.1, Sendai C-2	tonnes
42 Production from water-based cages or pens	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	tonnes
43 Total production loss	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	tonnes
44 Total input increase							units
45 Total clear shelter for national accounts	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	currency
V-Fisheries							
51 Small-scale production loss	SDG 1.5.2, Sendai C-2	SDG 1.5.2, Sendai C-2	SDG 1.5.1, Sendai C-2	SDG 1.5.2, Sendai C-2	SDG 1.5.2, Sendai C-2	SDG 1.5.1, Sendai C-2	tonnes
52 Small-scale production loss	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	units
53 Small-scale (large-scale) production loss	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	tonnes
54 Total input increase (fish gear, engines, vessels, storage, etc.)	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	Sendai C-2	units

This table was prepared for use in DSS-Fl by FAO Statistics Directorate. For more information or technical questions, please contact FAO Statistics, Rome. Definitions are according to national practices for agriculture statistics, and current international standards, such as the System of National Accounts (SNA, 2008) and current standards from FAO: <http://www.fao.org/zhua/standards/>

Implementation framework: Summary of statistics tables (con't)

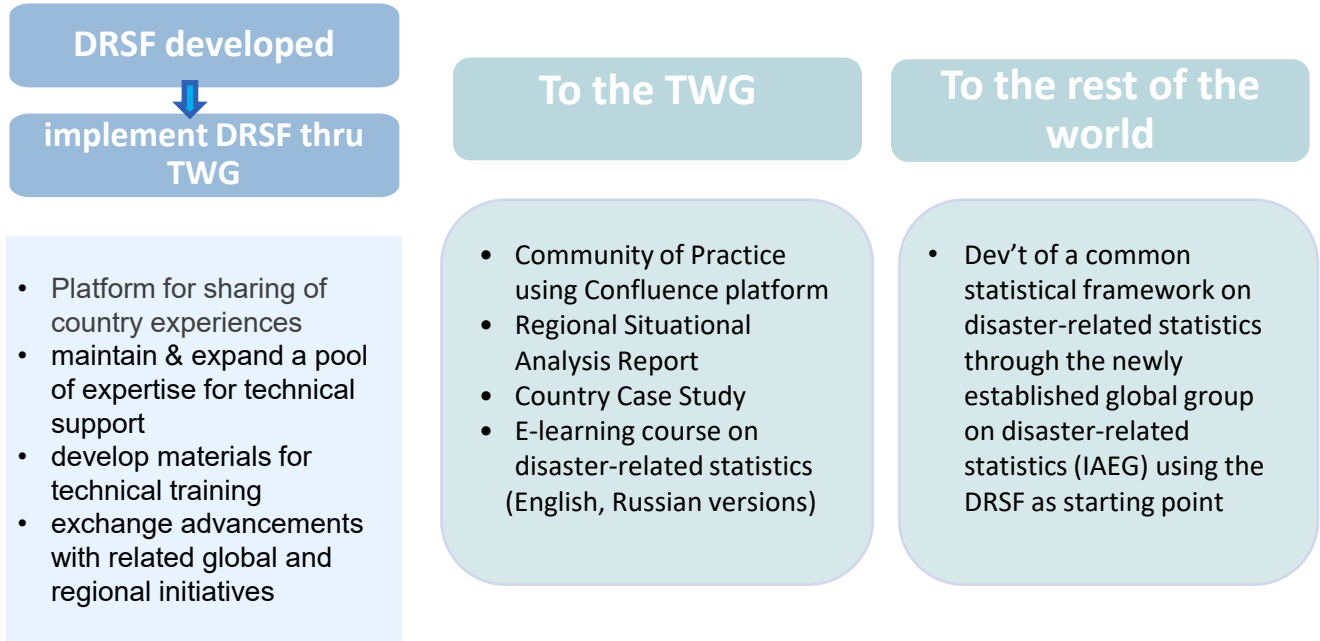
Example of G tables Table G2: Summary table of direct environmental impacts by hazards types and geographic regions

Environmental impacts can also be represented in relation to geographic regions.

In addition to land cover types (same classification as the SEEA), data can also be collected for functional categories of land cover that could be of special interest for assessing direct impacts, such as designated biological reserves and World Heritage sites.

	Region 1	Region 2	Region 3	Aggregation for multiple sourcing of events by Region(s)	NATIONAL TOTAL	Measurement units
Direct environmental impact						
1	Direct impacts on ecosystems by land cover types					
1.1	Urban and associated developed areas					hectares
1.2	Homogeneous herbaceous cropland					hectares
1.3	Agricultural plantations, permanent crops					hectares
1.4	Agricultural croplands and meadows					hectares
1.5	Pasture and natural grassland					hectares
1.6	Forest low cover					hectares
1.7	Shrubland, bushland, heathland					hectares
1.8	Sparsely vegetated areas					hectares
1.9	Natural vegetation associations and meadows					hectares
1.10	Barren land					hectares
1.11	Permanent snow and glaciers					hectares
1.12	Open waterbodies					hectares
1.13	Inland water bodies					hectares
1.14	Coastal water bodies and intertidal areas					hectares
2	Loss of critical ecosystems					
2.1	Non-Arid Biosphere and other biological reserves (UNESCO, UNEP)					hectares
2.2	Other designated ecosystems/habitats					hectares
2.3	Ecosystems hosting threatened species (IUCN Red List)					hectares
2.4	Other critical ecosystems					hectares
3	Losses of natural water resources (quantitative/qualitative)					
3.1	Losses due to pollution of natural surface water					res. of water bodies
3.2	Losses due to pollution of groundwater					res. of water bodies
3.3	Losses due to destruction of natural surface water resources					res. of water bodies
3.4	Losses due to destruction of groundwater reserves					res. of water bodies
4	Direct impacts to the atmosphere or climate change					
4.1	Emissions of GHGs					tonnes
4.2	Loss of carbon sequestration capacity					tonnes
4.3	Other direct impact on global warming					tonnes
4.4	Emissions of SO ₂					tonnes
4.5	Emissions of other (non-GHG) air pollutants (specify)					tonnes
Data sources: Collaboration between national monitoring authorities for land cover, water resources, and atmospheric conditions with initial impacts assessments of NDMAs after a disaster						

VI. Support of ESCAP on Disaster-related statistics



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