



TECHNICAL NOTES
Compendium of Philippine Environment Statistics 2012-2022
Component 4: Extreme Events and Disasters

I. Conceptual Framework

The Compendium is a compilation of environment and related socio-economic statistics collected from various government agencies. It is an adoption of the Framework for the Development of Environment Statistics (FDES) 2013.

FDES covers a core set of environment statistics which is grouped into six components namely: 1) environmental conditions and quality; 2) environmental resources and their use; 3) residuals; 4) extreme events and disasters; 5) human settlements and environmental health; and 6) environmental protection, management, and engagement.

As described in the FDES, the Basic Set of Environment Statistics has been set up following a progression of three tiers based on the level of relevance, availability, and methodological development of the statistics.

- Tier 1 is the core set of environment statistics that serves as an agreed and limited set of environment statistics that are of high priority and relevance to most countries.
- Tier 2 includes environment statistics which are of priority and relevance to most countries but require greater investment of time, resources, or methodological development. It is recommended that countries consider producing them in the medium term.
- Tier 3 includes environment statistics which are either of lower priority or require significant methodological development. It is recommended that countries consider producing them in the long term.

Global Set of Climate Change Statistics and Indicators (GSCCSI) is a comprehensive statistical framework, with statistics, indicators, and metadata, designed to support countries in preparing their own sets of climate change statistics and indicators according to their individual concerns, priorities, and resources. The Global Set is developed by the UN Statistics Division in collaboration with the UN Framework Convention

on Climate Change. The GSCCSI consists of five thematic areas, namely: drivers, impacts, vulnerability, mitigation, and adaptation.

Component 4: Extreme Events and Disasters

An extreme event is one that is rare within its statistical reference distribution at a particular location while disaster is often described as a result of exposure to an extreme event (United Nations [UN], 2013). This component organizes statistics on the occurrence of extreme events and disasters and their impacts on human well-being and the infrastructure of the human subsystem.

This component has two subcomponents: natural extreme events and disasters, and technological disasters. The statistics under this component are connected to the impact thematic area of the Global Set of Climate Change Statistics and Indicators (GSCCSI). These are also linked to the Sustainable Development Goal and Sendai Framework for Disaster Risk Reduction.

Subcomponent 4.1: Natural Extreme Events and Disasters

This subcomponent organizes statistics on the frequency and intensity of extreme events and disasters deriving from natural phenomena and their impact on human lives. Statistics on natural extreme events and disasters are important to policy makers, analysts, and civil society not only to assess the impact of an ongoing disaster, but also to monitor the frequency, intensity, and impact of disasters over time (UN, 2013). There are two topics under this subcomponent:

- 4.1.1 Occurrence of natural extreme events and disasters – includes statistics on type of natural disaster, location, magnitude, date of occurrence, and duration.
- 4.1.2 Impact of natural extreme events and disasters – includes information on the impact of natural extreme events and disasters such as number of people killed, injured, homeless, and affected, as well as economic losses and physical losses.

Subcomponent 4.2: Technological Disasters

This subcomponent organizes statistics on extreme events resulting from human intent, negligence or error, and/or faulty or failed technological applications. Statistics on human induced disasters are important to policy

makers, statistical analysts, and civil society to identify the immediate and potential impacts, to understand who is primarily responsible and to assess and mitigate future risks. Records of global technological disasters show increasing frequency and impact on humans, infrastructure, and environment. There are two topics under this subcomponent:

- 4.1.1 Occurrence of technological disasters – Includes information on the identification and characterization of different types of events, including information on type of disaster, location, date of occurrence, and duration.
- 4.1.2 Impact of technological disasters – Includes specific impacts on humans and damage to the economy and ecosystems arising from technological disasters such as number of people killed, injured, homeless, and affected, as well as economic losses and physical losses.

II. Data Source

The data on extreme events and disasters were obtained from the Office of Civil Defense (OCD).

III. Compilation Methodology

Following the structure and statistics listed in FDES 2013, data available within the national statistical system were identified and requested from data source agency. The collected data were checked for consistency and formatted into statistical tables.

IV. Definition of Terms

1. Affected Population – individuals and families who were devastated by the impact of disasters, whether physical harm/damage befell upon them or their properties and whose daily functions are interrupted by the disaster. ¹
2. Armed Conflict – any use of force or armed violence between States or a protracted armed violence between governmental authorities and organized armed groups or between such groups within that State: Provided, that such force or armed violence gives rise, to a

situation to which the Geneva Convention of 12 August 1949, including their common Article 3, apply. Armed conflict may be international, that is, between two (2) or more States, including belligerent occupation; or non-international, that is, between governmental authorities and organized armed groups or between such groups within a state. It does not cover internal disturbances or tensions such as riots, isolated and sporadic acts of violence or other acts of a similar nature.¹

3. Biological - a hazard caused by the exposure to living organisms and their toxic substances (e.g. venom, mold) or vector-borne diseases that they may carry. Examples are venomous wildlife and insects, poisonous plants, and mosquitoes carrying disease-causing agents such as parasites, bacteria, or viruses (e.g., malaria).²
4. Climatological – a hazard caused by long-lived, meso- to macro-scale atmospheric processes ranging from intra-seasonal to multi-decadal climate variability.²
5. Damages – material impacts that could be recovered, in principle, through future repairs.³
6. Direct Impacts – impacts happening during or shortly following disaster directly triggered by a hazard. Direct impacts include impacts to humans, and material impacts.³
7. Disasters – a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources. Disasters are often described as a result of the combination of: the exposure to a hazard; the conditions of vulnerability that are present; and insufficient capacity or measures to reduce or cope with the potential negative consequences. Disaster impacts may include loss of life, injury, disease and other negative effects on human, physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation.¹
8. Earthquake – a sudden and violent shaking of the ground produced by the sudden movement of rock materials below the earth's surface.

These disturbances usually occur along existing fault lines or zones of structural weaknesses. There are two ways by which we can measure the strength of an earthquake: magnitude and intensity.¹

9. Epidemic – refers to the occurrence in a community or region of cases of an illness, specific health-related behavior, or other health-related events clearly in excess of normal expectancy. The community or region and the period in which the cases occur are specified precisely. The number of cases indicating the presence of an epidemic varies according to the agent, size, and type of population exposed; previous experience or lack of exposure to the disease; and time and place of occurrence.¹
10. Geophysical – a hazard originating from solid earth. This term is used interchangeably with the term geological hazard.¹
11. Hydrological – a hazard caused by the occurrence, movement, and distribution of surface and subsurface freshwater and saltwater.¹
12. Indirect Impacts – consequences of a disaster for which causality is not directly observed and therefore must be estimated via application of some assumptions and analysis. Consists of various forms indirect consequences to the people, social condition, the economy, or the environment. From United Nations (UN) (2015), indirectly affected are: “people who have suffered consequences, other than or in addition to direct effects, over time due to disruption or changes in economy, critical infrastructures, basic services, commerce, work or social, health and psychological consequences.”³
13. Injured – the number of persons whose health or physical integrity is affected as a direct result of the disaster. Does not include victims who die.³
14. Internally Displaced Population/Persons (IPDS) – persons or groups of persons who have been forced or obliged to flee or leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or natural or human

made disasters, and who have not crossed an internationally recognized State border.¹

15. Intertropical Convergence Zone – series of low pressure areas brought about by converging northeast (NE) and southeast (SE) winds that cause thunderstorms and rainshowers.¹
16. Landslide – a massive outward and downward movement of slope-forming materials. It is restricted to movement of rocks and soil masses.¹
17. Magnitude – proportional to the energy released by an earthquake at the focus. It is calculated from earthquakes recorded by an instrument called seismograph. It is represented by Arabic Numbers (e.g., 4.8, 9.0).¹
18. Meteorological - a hazard caused by short-lived, micro- to meso-scale extreme weather and atmospheric conditions that last from minutes to days.¹
19. Missing Person – refers to an absent person whose whereabouts, safety and well-being cannot be established after 24 hours from his/her perceived disappearance.¹
20. Northeast Monsoon (Amihan) – cold winds from the northeast that bring rains over the eastern side of the country.¹
21. Partially Damaged Houses – livable with reusable shelter materials and/or with the existing/remaining features based on its original structure.¹
22. Severe Tropical Storm – a tropical cyclone with a maximum sustained wind of 89 to 117 km/h (48 - 63 knots 24 or 24.5 to 32.6 m/s).¹
23. Southwest Monsoon (Habagat) – warm moist winds from the southwest causing rains over the western portion of the country from May to September.¹
24. Storm Surge – happens when a very strong tropical cyclone blows off excessive amounts of seawater toward low-lying coastal

communities. It is catastrophic and life threatening because a storm surge can cause massive inland flooding, sometimes in unimaginable heights. It is even more dangerous when the storm surge coincides with high tide.¹

25. Super Typhoon – a tropical cyclone with a maximum sustained wind of greater than 222 km/h (>120 knots or 61.7 m/s).¹
26. Technological Hazard – “originate from technological or industrial conditions, dangerous procedures, infrastructure failures or specific human activities. Examples include industrial pollution, nuclear radiation, toxic wastes, dam failures, transport accidents, factory explosions, fires, and chemical spills. Technological hazards also may arise directly as a result of the impacts of a natural hazard event.”³
27. Thunderstorm – a localized (small scale) storm with massive cumulonimbus clouds producing lightning and thunder, and often brings heavy rainfall, or hail, as well as strong, gusty winds.¹
28. Totally Damaged Houses – entirely destroyed and unfit for habitation or without any of the structural features indicated on the partially damaged.¹
29. Tropical Cyclones – a generic term for warm core, non-frontal synoptic scale cyclone originating from tropical or subtropical waters with organized deep convection and a closed surface wind circulation about a well-defined center.¹
30. Tropical Depression – a tropical cyclone with a maximum sustained wind of less than 62 km/h (<34 knots or 17.2 m/s).¹
31. Tropical Storm – a tropical cyclone with a maximum sustained wind of 62 to 88 km/h (34 - 47 knots or 17.2 to 24.4 m/s).¹
32. Typhoon – a tropical cyclone with a maximum sustained wind of 118 to 222 km/h (64 - 120 knots or 32.7 to 61.7 m/s).¹
33. Volcanic Eruption – the ejection of volcanic materials such as lava, ashes, rock fragments steam and other gases through crater, vent, or fissure brought about by tremendous pressure which forces

to open the rock formation overlying pockets of molten rocks or steam reservoirs found under the earth's crust.¹

V. Dissemination of Results and Revision

The Compendium of Philippine Environment Statistics is published and posted on the PSA website every year. The web release material includes press release, statistical tables, infographics, and social cards.

List of Statistical Tables:

Table No. 4.1.1	Occurrence of Natural Extreme Events and Disasters by Type for Minor Incidents
Table No. 4.1.2	Occurrence of Natural Extreme Events and Disasters by Type for Major Disasters
Table No. 4.2.1	Occurrence of Human Induced Disasters by Type for Minor Incidents
Table No. 4.2.2	Occurrence of Human Induced Disasters by Type for Major Disasters
Table No. 4.3.1	Number to Deaths due to Natural Extreme Events and Disasters by Type for Minor Incidents
Table No. 4.3.2	Number to Deaths due to Natural Extreme Events and Disasters by Type for Major Disasters
Table No. 4.4.1	Number of Deaths due to Human Induced Disasters by Type for Minor Incidents
Table No. 4.4.2	Number of Deaths due to Human Induced Disasters by Type for Major Disasters
Table No. 4.5.1	Number of Injured due to Natural Extreme Events and Disasters by Type for Minor Incidents
Table No. 4.5.2	Number of Injured due to Natural Extreme Events and Disasters by Type for Minor Incidents
Table No. 4.6.1	Number of Injured due to Human Induced Disasters by Type for Minor Incidents

¹ National Disaster Risk Reduction and Management Operations Center – Standard Operating Procedures and Guidelines 2021 Edition

² Centre for Research on the Epidemiology of Disaster – Emergency Events Database Classification

³ Disaster-related Statistics Framework Glossary

Table No. 4.6.2	Number of Injured due to Human Induced Disasters by Type for Major Disasters
Table No. 4.7.1	Number of Missing due to Natural Extreme Events and Disasters by Type for Minor Incidents
Table No. 4.7.2	Number of Missing due to Natural Extreme Events and Disasters by Type for Major Disasters
Table No. 4.8.1	Number of Missing due to Human Induced Disasters by Type for Minor Incidents
Table No. 4.8.2	Number of Missing due to Human Induced Disasters by Type for Major Disasters
Table No. 4.9.1	Number of Affected People due to Natural Extreme Events and Disasters by Type for Minor Incidents
Table No. 4.9.2	Number of Affected People due to Natural Extreme Events and Disasters by Type for Major Disasters
Table No. 4.10.1	Number of Affected People due to Human Induced Disasters by Type for Minor Incidents
Table No. 4.10.2	Number of Affected People due to Human Induced Disasters by Type for Major Incidents
Table No. 4.11.1	Number of Damaged Houses due to Natural Extreme Events and Disasters by Type for Minor Incidents
Table No. 4.11.2	Number of Damaged Houses due to Natural Extreme Events and Disasters by Type for Major Disasters
Table No. 4.12.1	Number of Damaged Houses due to Human Induced Disasters by Type for Minor Incidents
Table No. 4.12.2	Number of Damaged Houses due to Human Induced Disasters by Type for Major Incidents
Table No. 4.13.1	Damages due to Natural Extreme Events and Disasters by Economic Activity for Minor Incidents
Table No. 4.13.2	Damages due to Natural Extreme Events and Disasters by Economic Activity for Major Disasters
Table No. 4.14.1	Damages due to Human Induced Disasters by Economic Activity for Minor Incidents

Table No. 4.14.2	Damages due to Human Induced Disasters by Economic Activity for Major Disasters
Table No. 4.15 to 4.16	Major Natural Extreme Events and Disasters
Table No. 4.17	Major Human Induced Disasters

VI. Citation

Philippine Statistics Authority. (29 June 2023). *Technical Notes on Compendium of Philippine Environment Statistics 2012-2022 Component 4: Extreme Events and Disasters*
<https://psa.gov.ph/content/compendium-philippine-environment-statistics-component-4-extreme-events-and-disasters>

VII. Contact Information

Ms. Virginia M. Bathan
Chief Statistical Specialist
Environment and Natural Resources Accounts Division
(632) 8376-2041
enrad.staff@psa.gov.ph

For data request, you may contact:
Knowledge Management and Communications Division
(632) 8462-6600 locals 839, 833, and 834
info@psa.gov.ph