# DesInventar
# Disaster Inventory System

# Methodological Guide

# Version 8.1.9
# 2009

**http://www.osso.org.co**  **http://www.desenredando.org**

# Contents

# Introduction

*The Network of Social Studies in the Prevention of Disasters, constituted in 1992, formulated in its Agenda of Research and Organic Constitution that:*

> *Population growth and the processes of urbanisation, tendencies in the occupation of territory, growing poverty in important segments of the population, the utilisation of inadequate technological systems in the construction of homes and in the endowment of basic infrastructure, and inadequate organisational systems, among others, have continually increased the vulnerability of the population when faced with an ample diversity of physical-natural events-.*

In spite of this, there is, on the one hand, an absence of systematic, homogeneous and comparable registers, about the typology of disasters, understood as the adverse effects of an occurrence of threatening events under conditions of vulnerability in every region, country or city; and on the other hand, the conception that disasters should only be considered in terms of the effects of those events of magnitude and great impact, has made invisible thousands of annual disasters which occur sporadically in the countries of regions such as Latin America and the Caribbean, Asia and Africa

In contrast, in many countries there are institutions and researchers interested in this topic, who use diverse tools to systematise the information about disasters: generally they log information in databases or physical files designed with specific criteria and particular or regional interests, and in dissimilar formats. Additionally, there exists a huge volume of information to organise and systematise, principally from newspaper sources.

This disperse information needs to be compiled, homogenised and analysed. And, furthermore, it must be geographically referenced, because disasters (damaged communities and infrastructure), due to the effects of each type of event (threats), are regionalised variables.

A common objective in the regions and countries of Latin America and the Caribbean, Asia and Africa is to generate capacity of both retrospective and prospective analysis and of spatial-temporal representation of the effects (disasters) derived from conditions of threat and vulnerability, for the application of risk management - from mitigation work, to attention and recuperation post-disaster. The qualitative and quantitative evaluation of growth of vulnerability necessitates a solid documental base and register, as much for events from the past as for those events occurring daily. In support of the achievement of these common objectives from diverse regions, LA RED began, at the end of 1993, the project Inventory of Disasters in Latin America, which is its pilot phase consisted of: x) discussion and agreement of conceptual criteria and methodologies for the analytical treatment of disasters, seen from

diverse levels of spatial resolution; x) gathering of information about disasters during the period 1990-1999 from available sources, in a sample of Latin American countries (Mexico, Guatemala, El Salvador, Costa Rica, Colombia, Ecuador, Peru and Argentina); and x) development of a software-based instrument for this purpose.

LA RED has developed this methodology with the intention of providing the diverse actors involved in activities for the prevention and mitigation of disasters (governments, national planning systems for attention during emergencies and disasters, regional and local preventative organisms, aid organisms, international and bilateral agencies, insurance companies, as well as organised communities, the media, and researchers) with greater capacity for the gathering, processing, analysis and homogeneous representation of disasters, understood as the adverse effects on people, goods and infrastructure which are vulnerable to socio-natural and natural phenomena.

# What is DesInventar?

*DesInventar is a conceptual and methodological development which deals with disasters of all magnitudes and a diversity of environments: local, national and regional.*

It is conceptual on the one hand, because it does not only consider high-impact events on regions or countries, but also sporadic effects of this type of event on vulnerable communities at a local scale, and on the other, because it also considers as disasters all losses stemming from impacts of phenomena which are natural, technological or anthropological in origin, which occur frequently in these communities.

It is methodological because, based on definitions of adverse effects and losses, it allows these to be placed in function of the spatial-temporal variables in which they take place. Because of this, it makes the geographical representation of all variables considered through the gathering of data possible, so that it enables a vision of the event starting from a local perspective to visions that are integrated spatially at national scales, as well as multi-temporal visions at these scales.

It is a system which inventories disasters; a methodology for registering information about the characteristics and effects of diverse types of disasters, with a special interest in disasters at a regional or national scale, which in turn enables a look at the accumulation of these types of local disasters from a national and regional perspective.

The methodology of DesInventar, created so as to be flexible and adaptable, is applicable to political-administrative units of planning, management or institutional operations, from national resolution levels to detailed levels, for example, a city grouped in neighbourhoods or blocks.

Thus, DesInventar is the synthesis of a process by which research groups, linked to LA RED, propose a unified conceptual and methodological framework which deals with disasters, and at the same time, is an instrument for the development of its proposed objectives. The basic criteria which guide DesInventar are:

- All the inventories use the same variables to measure effects, and have the same basic and homogeneous classification of events. Gathered and processed information is input into a timescale and a geographically references spatial level.

- The inventories are treated analytically, through system tools, as a basic requisite to gain spatial and temporal visions of the occurrence of disasters, in order to support comparative research and risk management.

# General Information

*The current DesInventar Guide develops a general methodology, previously mentioned, and contains an overview of criteria and recommendations for its implementation. The Guide has been written based on the experiences of work groups in eight countries in Latin America: Mexico, Guatemala, Salvador, Costa Rica, Colombia, Ecuador, Peru and Argentina, as well as on the conclusions of four international workshops (1994-1996) and, its methodological and conceptual proposal has been enriched by experiences with other users and projects: SINAPROC of Panama, CEPREDENAC in Central America, Misions of Post Disaster Aid in Honduras, Nicaragua, Peru, Venezuela and El Salvador; University of Florida (USA), University of Chile and PNUD in India. The Guide was corrected and updated in June 2003, based on the previous version of 1998.*

The Guide has been organised to correspond with the sequence of tasks required for the implementation of a project to inventory disasters. Initially, the resolution and geographical setting must be defined, with which characteristics the inventory can be compiled and the DesInventar concept of the disaster revealed. Secondly, the user should get to know well the characteristics and the data required in the pre-defined fields of the inventory and, if necessary, should design and create complementary fields on the extended record. Following this, there are a series of suggestions to improve the process of data input in the inventory. Towards the end, there is a section on frequently asked questions on the application of the methodology.

On behalf of LA RED, and the coordination of DesInventar in Corporación OSSO (Colombia), we hope that this Guide will provide adequate support for users, and will be of benefit in making projects available which help all countries, institutions and people who work in risk management.

# Definition of a database

*In DesInventar, a database is an inventory of the effects of disasters of diverse impact, with systematic information, brought together in a specific spatial resolution and with effect variables and homogeneous events.*

# Definition of geography

*In order to understand and use the geography in DesInventar, two basic concepts should be kept in mind: the resolution, which corresponds to the level of spatial detail with which the data should be registered, and which should be the same for all records in the database; and the hierarchy of zoning or geographic levels, which implies that the highest zoning level (that of the least resolution) includes subordinate levels, until you arrive at the chosen level as a resolution in the database.*

## *Resolution*

Traditionally, no effort has been made to define something resembling a homogeneous resolution of a disaster inventory. Simply, catastrophic events are recorded with the resulting total loss, which normally involves one or more geographical or political-administrative units of different size and composition. This is a direct consequence of a view of disasters by the operative component of emergency response agencies and organisations, and is a view which has prevailed for many years.

High or low level detail is talked about, referring to the spectrum of action that a risk management organism undertakes: for a national organism, this level of detail is lower than that of an organism which works on an urban scale.

The level of detail is called the resolution of the inventory, and should be chosen according to

practical criteria. Normally, an already established political-administrative or statistical (census) level of division is recommended, although it is possible, depending on specific needs, to use other zoning, for example, postal zoning or hydrographical basins.

The recommendation of using a pre-established zoning system has several advantages. On the one hand, normally there are entities responsible for each zone, from an administrative, political and/or disaster prevention perspective. This is the case at sub-national levels (states, provinces, counties) and at local level (districts, blocks, towns), where governments provide, or at least should provide, plans and resources for risk management.

Additionally, the availability of other types of information associated with the adopted zoning system enables or facilitates socio-economic comparisons of disasters seen from the same resolution. This information may refer to number of inhabitants, population density, use of land, constructive typologies, income per capita, environmental variables, etc.

It should be noted that while non-traditional zoning systems (ie, squares, operative zones) may be homogeneous or useful, it is difficult to make them practical for risk analysis of disasters and socio-economic indicators of vulnerability.

## *Hierarchy*

DesInventar works with geography through levels and layers. The highest zoning level (that of the lowest resolution) includes subordinate levels. A union brings together several areas, following certain criteria. In political zones, this is a common concept: for example, a state (province or county) groups together several towns; in its turn, a country is made up of a group of states. In order to select the geographic levels it is convenient to use practical criteria, similar to those mentioned for choosing the level of resolution, from the highest to the lowest. Another reason that the grouping levels reflect political or administrative regions is that the inventory may be useful at these decision-making levels.

The highest grouping level (lowest resolution) is designated in DesInventar as – Level 0 -, the next as – Level 1 – and so on. An element in a subordinate level may only be part of a higher level.

The following are practical examples of zoning levels and their geographic elements;

> On a national scale: In Mexico: States and Towns; In Peru: Departments, Provinces and Districts; In India: States, Districts and Blocks

On an urban scale:  In Cali (Colombia): Communes and Neighbourhoods, In Lima (Peru): Districts and Neighbourhoods

In cities, Communes, Neighbourhoods and Block may be considered as zones, with blocks being the resolution of the inventory, and, because of this, the level of data collection.

# Definition of Events

*An event is a phenomenon – natural, socio-natural or technological – which acts as a detonator of adverse effects on human lives, health, and/or economic or social infrastructure in a community. In DesInventar, a list of pre-defined events is used which allows the user to choose the most relevant. Pre-defined events should not be duplicated.*

Remember that in DesInventar, an event is different from a disaster. An event may trigger multiple disasters as well as affecting different geographical units. This means that the statistics which DesInventar records, differ from statistics which use the traditional definition of disaster, but only insofar as the number of registers, not with respect to the effects and damages.

In contrast to specialised institutions such as meteorological and seismological services, DesInventar does not include all events (normal rainfall which does not produce adverse effects, tremors of low magnitude and intensity, floods in regions that are unoccupied or uncultivated. DesInventar does not intend to make inventories of events , and much less to replace those information services of environmental variables in different countries. Only events which have generated some kind of affect are included.

It should be noted that on a local scale, trigger events may in their turn be triggered by other types of events on a broader occurrence scale. This is the case, for example, in epidemics generated by climate change, flood, flash-flood, landslide, storm surge, storm etc, derived from hurricanes. The current tool of DesInventar is still unable to facilitate the grouping of these multiple disasters for certain analysis needs.

## *Predefined Events*

In all the databases a list of events, predefined according to the methodology of DesInventar, is available. The selection of terms to denominate these types of Events is not "orthodox", as

seen from disciplines such as geology, meteorology, etc, but rather is an attempt to arrive at the most common designations for the different phenomena that can affect countries. The selection process relied on the consultation of diverse dictionaries and technical glossaries (which by no means should be seen as exhaustive), along with discussions in international workshops with research participants from social, economic and natural physics sciences. The intention is to provide a gathering of terms which are as homogeneous as possible and which may be useful for projects in different countries whose sources of information are not always specialised.

In order to maintain homogeneity between diverse databases and to facilitate comparability, it is important that users refer to the list of pre-defined events. Each of the events has a description and group of terms that are synonyms, in order to make this clearer for users.

## *Personalised Events*

DesInventar has left open the possibility of creating a frequent event in a region, but it is important to systematise this, if it is not to be found in the list of pre-defined – Events - in DesInventar.

If, after a close revision of the definitions of pre-defined events, you have an event that is not to be found in the list, you may proceed to create a personalised event. Personalised events may be only be consulted in the database where they were created.

### Accident
Vehicular, rail, air or maritime transport accidents. This term is limited to those accidents resulting from natural phenomenon such as landslides, earthquakes, hurricanes, rainfall or adverse atmospheric conditions, etc. It includes those transport accidents which generate leaks of toxic substances, whatever the cause. Key words: vehicular accident, train accident, air accident, shipping accidents.

### Alluvium
Torrents of water which drag great quantities of solid material (pebbles, gravel and rocks). This term is applicable when referring to the effects of sudden rainfall on hitherto dry regions or dry riverbeds. Key words: torrent, mudslide, landslide.

### Avalanche
Fall or loosening of masses of ice and/or snow. Key words: avalanche.

### Biological migration or loss
Death or migration of biological species. This may be ultimately attributable to contamination

or to drastic changes in environmental parameters. One example is the red tide- the warming of waters due to the phenomenon of El Niño or the lessening of optimum amounts of oxygen due to obstacles imposed by humans, such as dams and barrages.

**Change in coastline**
Variation in the coastline and/or maritime areas near the coast. Includes the formation and destruction of islands, beaches and sand-dunes, erosion of cliffs, with effects on population, on navigation, etc.

**Contamination**
Concentration of contaminating substances in the air, water or soil, at levels which are damaging to human, animal, or plant life.

**Drought**
Period of dryness, without rainfall or insufficient rainfall. Generally it refers to prolonged periods (months, years or even decades) which may occur in restricted continental areas or in regional steppes escalas . Excludes  Heatwave  although a Heatwave- may occur during a period of drought.

**Earthquake**
An earthquake or a quake is the abrupt shaking of the earth caused by movement of tectonic plates. Key words: tremor, quake, upheaval, seismic movement.

**Electrical storm**
Concentration of atmospheric electrical discharge (lightning) with effects on people, animals and domestic goods, infrastructure (for example, on electrical networks resulting in power cuts), or industry. This term is distinct from storm- in that it is not accompanied by rain and strong winds.

**Epidemic**
Disease which attacks one or more individuals in the same area (over days, weeks, months) exceeding the expected frequency: such as cholera, typhoid fever, bubonic plague, etc. It should be taken into account that the declaration of an epidemic depends on the endemic conditions of the disease and the region. Key words: illness, endemic, pandemic.

**Explosion**
Abrupt liberation of a large amount of energy (thermic, chemical or nuclear), accompanied by thunderous noise and violent rupture of the containing recipient, producing heat, light and gases. Includes explosions related to human error or faults in infrastructure systems. In the normal DesInventar- inventories this term excludes acts of war or terrorism.

**Fire**
Urban, industrial or rural fires, as distinct from forest fires.

**Fog**
Cloud banks which descend to or rise from the earth surface and which imply effects on transport or other activities, due to loss of visibility. This term excludes loss of visibility due to contamination generated by pollution, including fires of any type. Key words: mist.

**Forest fire**
Includes all types of fires in open land in rural areas, in natural woods, cultivated forests, meadows, prairies, etc.

**Frost**
Fall in temperature with damaging effects on people, crops, goods and services. Key words: cold front, cold wave, freeze.

**Gale**
Atmospheric disturbance which generates strong, destructive winds, normally without rain. Excludes Tornado- and Cyclone- Key words: wind, strong wind, hurricane-force winds, whirlwind, squall, blizzard, typhoon, gust.

**Hail**
Small balls of frozen water which fall violently from clouds, mostly hard and thick, but not in flakes like snow. Key words: sleet, hailstone.

**Heatwave**
Increase in temperature in a region which affects people, crops, goods and services.

**Hurricane**
Tropical depression relating to a violent atmospheric anomaly, characterised by strong winds and rain, which act like a whirlwind. It occurs in the Caribbean Sea and the tropical Pacific Ocean. Where the term "hurricane" - has been used in sources to refer to hurricane winds, local gales, whirlwinds, storms etc, these will be reported as "gales"-. Local storms are reported as "storms" -. Key words: tropical depression, cyclone, typhoon.

**Inundation**
Flooding or covering with water of an area where people, crops, goods or infrastructure are located. Flooding caused by sea waves in coastal areas will be reported using the term *oceanic surge*-.

**Landslide**
Mass movement of the earth surface. Key words: landslide, subsidence or settling, drift, cave-in, crevice formation, collapse of caves or mines, rockfall, crumbling of earth or rocks (slowly or quickly) down slopes or hillsides, blockage of roads, channels, excavations.

**Leak**
Seepage or escape of toxic and/or radioactive substances, liquids, solids or gases (e.g., gas leak). This may be caused by technological accidents, by human error or negligence.

**Liquefaction**
Momentary behaviour as when granular soil is saturated by water, losing its capacity to bear weight. In spite of being a secondary phenomenon or caused by an earthquake-, it has been included here as a cause of loss or damage in many inhabited areas, coastal as well as continental. Key words: liquefaction.

**Other**
When the disaster is not related to any of the aforementioned terms. Before using this term to refer to an event, the possibility of using events already listed should be eliminated. If the event recurs in the inventory and there is nothing that covers this event in the list, we suggest creating a new event.

**Panic**
Panic or collective hysteria in mass events (stadiums, cinema halls, etc) which leads to death, injury and/or destroyed materials. When the panic is induced by natural phenomena (eg. earthquakes, landslides, floods, etc) it will be reported as effects of these events, always assuming there is damage or associated effects.

**Plagues**
Proliferation of organisms which affect communities, agriculture, livestock or fishing goods. For example: rats, locusts, African bees, etc.

**Rainfall**
Pluvial precipitation. Includes isolated, persistent or torrential rainfall in a specific region, as well as longer periods of rainfall. Key words: storm, deluge, cloudburst, downpour, showers (persistent drizzle when resulting in disasters, for example, in arid or semi-arid regions), squall.

**Sedimentation**
Deposits of solid material produced by mass movement of hillside due to superficial erosion, along riverbanks, by flood, flash flood, torrential flow of water, avalanche, tidal surges, or tsunami.

**Snowfall**
Fall and accumulation of snow. Key words: snow.

**Storm**
Rainfall accompanied by strong winds and/or electrical discharge (lightning flashes). Generally and also due to regional connotations it may be impossible to distinguish between a

storm- and a gale-. Key words: tempest.

### Storm surge

Massive waves along the coast, caused by hurricanes, gales, storms; convergence the direction of winds and periods of high tide, or by increases in sea level due to the phenomenon El Niño. In some areas the rising of sea levels to maximum fortnightly heights is known as flood tide- and spring tide applies to yearly maximums. Key words: flood tide, storm tide, swell.

### Structural collapse

Damage to or collapse of any kind of structure (including those associated with electrical networks, aqueducts, or drainage) due to such phenomenon as overcrowding of public places, lack of maintenance, stressed materials, inadequate design. This term includes structural damage that, while not necessarily leading to collapse, renders the structure unusable. This type of damage may be reported as a fault- (as in structural fault). The damage to structures caused by natural phenomenon (eg, earthquakes, landslides, flooding, etc) is reported as an effect of those phenomena. Key words: structural fault.

### Tornado

A column of strong, spinning wind in the shape of a funnel which comes to the earth from cumulonimbus clouds. May include rain, hail and lightning.

### Torrential flow

Violent flow of water in a gorge, sometimes reported as a sudden rise or as a torrent. This term is applied, for example, when a landslide- is reported, when the torrent carries tree trunks and/or abundant sediment, ranging from fine-grained to masses of rock. It may be caused by rainfall, rupture of a dam, or by abundant landslides in a gorge. It excludes avalanches, as these imply snow or ice fall. Key words: flash flood, rapids,

### Tsunami

Applied to waves generated by movement at the bottom of the sea by earthquakes, volcanic eruptions or landslides. The terms storm surge-, flood tide, surge, or swell will be reported as storm surge- if they do not strictly correspond to a Tsunami-.

### Volcanic Activity

Eruption or emission of solid material, liquid or gas through openings or fissures in the earth surface. Includes eruptions of volcanoes of mud (diapirs). Key words: lava emission, vapour emission, ash emission, mud or earth emission, water emission, rock emission.

# Definition of Causes

*The phenomenon which immediately caused the event. Normally disasters are caused by a combination of circumstances relating to the socio-cultural, economic, political and historical environment, which may combine with an event to detonate the disaster, whether this is a phenomenon of natural or anthropological origin.*

One of the objectives of DesInventar's methodology, and precisely one of the motives for its development, is to validate or improve hypotheses about the relationship between disasters and conditions of vulnerability. For that reason, it should try to facilitate the relation between inventories and other social, economic or environmental variables.

In some cases, the cause is attributed to phenomena of wider spatial or energy coverage (earthquakes, hurricanes, etc.) which would thus encapsulate other, obviously fundamental, variables such as planning and use of land, overcrowding and deterioration of living conditions for large sections of the population, etc.

Strictly speaking every disaster, however natural it may appear, occurs because of an imbalance between complex variables and dynamics of which a social environment or one of infrastructure is constructed - services and internal factors (vulnerable conditions) as much as external factors (the event of natural or anthropological origin) which bring to light the risk and lead to the event taking place.

The theme of multi-causality of disasters is still an area for academic and conceptual debate, and one which DesInventar does not intend to cover. For this reason, we have left open the possibility of creating new causes, although it is recommended that users first try to adjust their cause to the pre-defined list.

Once the inventories have been carried out, this is the primary material for analysis and research on vulnerability scenarios, factors of threat and construction – projection of risk scenarios, with which data analysts, researchers, planners and governments may make better decisions for risk management at the levels created by DesInventar.

## *Pre-defined Causes*

A list of causes have been pre-defined, the application of which is not always direct or self-evident. For this reason, they have been included in a general guide.

## *Personalised Causes*

It is recommended that the use of the causes – Other Cause – and – Unknown – be avoided, without first revising carefully the list of causes. Then, depending on necessity and context, a cause can be created.

### Atmospheric conditions
Refers to adverse atmospheric conditions such as strong rainfall, fog, wind, electrical storm or a combination of these events. May be caused by regional or continental oceanic circulation of atmospheric masses such as cold fronts or zones of intertropical convergence.

### Behaviour
Customs or cultural practices which lead to the existence of a socio-natural or anthropological event. May refer to disaster or emergency situations caused by panic; lit lamps or candles; failure to take precautionary measures; human dwellings in flood areas or landslide-prone areas due to ignorance of their effects or because it goes against the norm. Key words: carelessness, lack of foresight.

### Contamination
Concentration of contaminating substances in the air, water or soil, at levels which may be damaging to human, animal, or plant life. May cause biological intoxication, plagues etc.

### Design
Errors or failure in design and/or construction of civil works, industrial installations, infrastructure systems etc, which lead to collapse, accidents, explosions, leaks, subsidence, torrential flows and floods (eg, when a dam breaks).

### Deterioration
Loss or lessening of the normal conditions of a construction or infrastructure. Applies to deterioration, through use or lack of adequate maintenance and/or effects of some external phenomenon, to edifices such as housing, service buildings, institutional buildings and/or vital network systems, bridges, etc. which may result in malfunction, collapse, fires, etc.

### Drought
Period of dryness, without rainfall or insufficient rainfall. Cause of forest fires, biological migration or loss.

### Earthquake
Abrupt shaking of the earth caused by movement of tectonic plates. Generates tsunami, landslides, melting, flash floods, structural collapse, fire, explosion, accidents, change in coastline, etc. Key words: tremor, quake, upheaval.

**El Niño - Southern Oscillation (ENSO)**
A phenomenon which generates global or regional anomalies in the weather, such as droughts, heat waves, epidemics, but also rain, floods, flooding due to alluvium deposits, and frost among others. Many newspaper reports attribute periods of excessive or diminished rainfall to El Niño. However, only events strictly attributable to El Niño should be included. In the last two decades these are: 1982 □ 1983 (very strong), 1987 (moderate) 1991 □ 1992 (moderate?) and 1997 to 1998 (moderate). El Niño or La Niña should only be referred to as causes when there has been official and/or academic confirmation of their relationship to the event. Key words: warm phase or episode of ENSO.

**Erosion**
Wearing away of the earth surface by external agents such as water or wind. Includes hydraulic erosion, wind erosion and erosion caused by subterranean water. Cause of landslides.

**Explosion**
Abrupt liberation of a large amount of energy (thermic, chemical or nuclear), accompanied by loud noise and violent rupture of the containing recipient, producing heat, light and gases. Cause of fire, landslides, etc.

**Fault**
Rupture of the earth crust due to an accumulation of tectonic forces or pressure in volcanos. Cause of earthquakes. Excludes everything that may be referred to as a □fault- due to the malfunction of equipment or networks or as a cause of landslides

**Fog**
Cloud banks which descend to or rise from the earth surface. Implies loss of visibility. Cause of accidents. Key words: mist.

**Gale**
Atmospheric disturbance which generates strong, destructive winds, normally without rain. Cause of landslides. Key words: wind, strong wind, hurricane, whirlwind, squall, blizzard, typhoon, gust.

**Human error**
Mistake or erroneous action in the operation of industrial plants, management of machinery or infrastructure systems which cause technological events such as fires, explosions, leaks, accidents, structural collapse, etc.

**Inundation**
Flooding or covering with water of an area where people, crops, goods or infrastructure are located. Cause of sedimentation, epidemics, landslides.

**La Niña (Pacific cold episode)**
Symmetrical phenomenon to El Niño. Key words: cold phase or episode of ENSO

**Landslide**
Mass movement of earth surface. Cause of flash floods, tsunami, sedimentation etc. Key words: landslide, subsidence or settling, drift, cave-in, crevice formation, collapse of caves or mines, rockfall, crumbling of earth or rocks (slow or fast) down slopes or hillsides, blockage of roads, channels, excavations.

**Leak**
Seepage or escape of toxic and/or radioactive substances, liquids, solids or gases. Cause of landslides, fires, poisoning, etc. Excludes the effects of ☐volcanic eruption-.

**Location**
Physical conditions relating to the planned or unplanned settlement of people or vulnerable infrastructure in unstable or flood-prone areas (illegal settlements, slums or their local denominations such as shanty towns, ☐favelas☐ or ☐precarios☐.

**Logging**
Equivalent to deforestation. Cause of flooding, landslides, biological migration or loss, etc.

**Negligence**
Action or omission which triggers adverse consequences for an individual or community. Attributable to persons who exercise power, governmental, non-governmental or private institutions or entities. Applies to disasters where the principal cause identified is negligence by those responsible, either in the provision of basic services or by failure to prevent or mitigate activities specifically identified prior to the event.

**Other**
This term should be used only when the cause remains undefined in the list of ☐official causes- of DesInventar. A description should be provided of the same. If it is a frequent cause in the inventory and may not be included in any of the predefined causes, a new cause should be defined.

**Overflow**
A sudden or slow rise in water levels in small areas or wider regions which causes water to escape from natural boundaries (river banks, lake or pond boundaries), reservoirs or overflow systems. Cause of flooding, flash floods, torrents.

**Plagues**
Proliferation of organisms which affect communities, agriculture, livestock or fishing goods. Cause of epidemics, contamination, etc.

**Rainfall**
Pluvial precipitation. Primary cause or catalyst of floods, flash floods, landslides, accidents, etc. Key words: storm, deluge, cloudburst, downpour, showers.

**Short-circuit**
Circuit which is produced by accidental contact between two conductors of opposing poles and usually causes a discharge. In houses, industry, commerce or in external electrical networks this may be a cause of fire.

**Storm**
Rain, accompanied by strong winds and/or electrical discharge. Cause of flooding.

**Thermic Inversion**
Presence of a layer of warm air between two cold fronts. Occurs frequently on cold mornings in valleys where there is little atmospheric circulation. This term is used in association with atmospheric contaminants which damage the health of living beings.

**Unknown**
The cause of the event is unknown and there is no explanation for the event.

**Volcanic Activity**
Eruption or emission of solid material, liquid or gas through openings or fissures in the earth surface. Cause of flash floods, tsunami, contamination (by gases or ash-fall). Key words: lava emission, vapour emission, ash emission, mud or earth emission, water emission, rock emission.

# Additional Effects

*Effects not contemplated in the list of basic effects in the Record, or which represent more detail than the data presented in these. For example, types of crops affected, discrimination between bridges affected or destroyed, etc.*

One of the most important themes in the prior development phase of an inventory of disasters is planning and identification of the necessity for more information than that contemplated in DesInventa's Record. This identification should lead to an organised and sustained design for a range of additional effects.

Create a list of thematic blocks of information, such as: prevention and risk mitigation activities undertaken prior to the event; additional and relevant information for the institution

about the disaster itself; data pertaining to response and immediate attention, to post-disaster recuperation, prevention and mitigation post-disaster, the role of other entities in the disaster, etc. and thematic blocks which amplify fields already contemplated in the Record: for example, types of bridges (pedestrian, vehicular), sex or age of affected persons, amplification of the field Health Sector (hospitals, health centres, etc).

Take into account an evaluation of the costs and consequences of assuming the additional load of acquiring, validating and processing the data designed, as well as the difficulties involved in both retrospective investigation and current operation of the inventory.

# Definition of Basic Effects

*The sum of loss or adverse effects which take place in a specific geographical unit. These are the direct indicators of conditions of vulnerability in communities, regions and countries.*

DesInventar works with a list of variables of effects commonly generated by a disaster such as, those that affect people, homes, vital infrastructure, and economic sectors.

In addition to the geographical reference (resolution level), data and type of detonating event, the –Effect - fields are the heart of DesInventar's methodology. Remember that we are not constructing historical series nor daily observations, nor meteorological services; rather, loss expressed as adverse effects.

The effects of disaster have been classified in four groups: Related to people; Related to homes; Related to infrastructure; Economic loss

**Deaths**
The number of persons whose deaths were directly caused. When final official data is available, this figure should be included with corresponding observations, for example, when there are differences between officially accepted figures and those of other sources. Suppositions about number of deaths, not officially verified, should be registered in the field - Observations of Effects – including the source of information.

**Loss value $**
Sum of losses directly caused by the disaster in local currency.

**Routes affected**

The length of transport networks destroyed and/or rendered unusable, in metres.

## Other losses
A description of other losses not included in the fields of the basic record. For example: religious buildings and monuments, architectural or cultural heritage buildings, theatres and public installations, public administration buildings relating to banks, commerce and tourism; vehicles or buses lost, bridges.

## Missing
The number of persons whose whereabouts since the disaster is unknown. It includes people who are presumed dead, although there is no physical evidence. The data on number of deaths and number of missing are mutually exclusive and should not be mixed.

## Loss value US$
The equivalent in dollars (US$) of the value of losses in local currency, according to the exchange rate on the date of the disaster. This figure is useful for comparative evaluations between databases.

## Crops and woods (Hectares)
The amount of cultivated or pastoral land or woods destroyed or affected. If the information exists in another measurement, it should be converted to hectares.

## Observations about the effects
Notes or detail about the effects of the disaster. This field should be used to register discrepancies between effect figures when there is more than one source.

## Wounded, sick
The number of persons whose health or physical integrity is affected as a direct result of the disaster. This figure does not include victims who die. Those who suffer injuries and or illness, if the event is related to a plague or epidemic, should be included here.

## Livestock
The number of animals lost (bovine, pig, ovine, poultry) regardless of the type of event (flood, drought, epidemic, etc).

## Affected
The number of persons who suffer indirect or secondary effects related to a disaster. This refers to the number of people, distinct from victims, who suffer the impact of secondary effects of disasters for such reasons as deficiencies in public services, commerce, work, or because of isolation. If the information refers to families, calculate the number of people according to available indicators.

## Educational centres

The amount of play schools, kindergartens, schools, colleges, universities, training centres etc, destroyed or directly or indirectly affected by the disaster. Include those that have been used as temporary shelters.

### Relocated
The number of persons who have been moved permanently from their homes to new sites. If the information refers to families, calculate the number of people according to available indicators.

### Health Sector
The number of health centres, clinics, local and regional hospitals destroyed and directly or indirectly affected by the disaster.

### Homes affected
The number of homes with minor damage, not structural or architectural, which may continue being lived in, although they may require some repair or cleaning.

### Evacuees
The number of persons temporarily evacuated from their homes, work places, schools, hospitals, etc. If the information refers to families, calculate the number of people according to available indicators.

### Victims
The number of persons whose goods and/or individual or collective services have suffered serious damage, directly associated with the event. For example, partial or total destruction of their homes and goods; loss of crops and/or crops stored in warehouses, etc. If the information refers to families, calculate the number of people according to available indicators.

### Homes destroyed
The number of homes levelled, buried, collapsed or damaged to the extent that they are no longer habitable.

### Transport
Qualitative field in the database. It has two options: Affected or Not Affected. It relates to the effects of the disaster on the transport sector: road networks (train or rail), transport stations, airports, river and sea bridges, sea walls, etc, that have been affected or destroyed.

### Communications
Qualitative field in the database. It has two options: Affected or Not Affected. It relates to damages to the communication sector: plants and telephone networks, radio and television stations, post offices and public information offices, internet services, radio telephones and mobile phones.

**Aid organisation installations**

Qualitative field in the database. It has two options: Affected or Not Affected. It relates to damages to the emergency response sector, specifically to the aid organisms' installations: Fire fighters and other aid organisms and to entities of public order.

**Agriculture and fishing**

Qualitative field in the database. It has two options: Affected or Not Affected. It relates to damaged to the Agriculture and Fishing sector: crops, granaries, pastoral zones.

**Aqueduct**

Qualitative field in the database. It has two options: Affected or Not Affected. It relates to damages to the aqueduct sector: water outlets, water treatment plants, aqueducts and canals which carry drinking water, storage tanks.

**Sewerage**

Qualitative field in the database. It has two options: Affected or Not Affected. It relates to damages to the sewage sector: sewage systems and treatment plants.

**Education**

Qualitative field in the database. It has two options: Affected or Not Affected. It relates to damages to the Education sector: everything relating to this sector – pre-schools, kindergartens, schools, colleges, universities, training centres, libraries, cultural centres, etc.

**Energy**

Qualitative field in the database. It has two options: Affected or Not Affected. It relates to damages to the Energy sector: dams, substations, transmission lines, generators, energy processing plants and combustible stores, pipelines, gas lines, nuclear plants.

**Industry**

Qualitative field in the database. It has two options: Affected or Not Affected. It relates to damages to the Industrial sector: all types and sizes of industry, including agricultural and fishing plants.

**Health**

Qualitative field in the database. It has two options: Affected or Not Affected. It relates to damages to the Health sector: everything related to the health sector, including communication networks, emergency networks (ambulances), casualty centres, etc.

**Other**

Qualitative field in the database. It has two options: Affected or Not Affected. It relates to damages which do not correspond to any of the fields in the basic record.