REPORT ON THE IERRIS WORKSHOP

Brussels
7-9 September, 1992

PROPOSED PRINCIPLES AND GUIDELINES

FOR THE

COLLECTION AND DISSEMINATION

OF DISASTER RELATED DATA

DHA-UNDRO
Secretariat of the IDNDR
UNEP
WFP
WHO/PAHO
USAID/FHA
IFRC
CRED

LIST OF ACRONYMS

CRED	Centre for Research on the Epidemiology of Disasters
DHA-UNDRO	Department of Humanitarian Affairs/ United Nations Disaster Relief Office
IDNDR	International Decade for Natural Disaster Reduction
IERRIS	International Emergency Readiness and Response Information System
IFRC	International Federation of Red Cross/Red Crescent Societies
ISO	International Standard Organisation
NGO	Non-Governmental Organisation
RDBMS	Relational Database Management System
UNEP	United Nations Environment Programme
USAID/FHA	United States Agency for International Development / Bureau of Food and Humanitarian Assistance
WFP	World Food Programme
WHO/PAHO	World Health Organisation / Pan American Health Organisation

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FOREWORD

The need for a database compiling an essential minimum set of information on emergencies occurring worldwide has been recognized to be essential for strategic planning, fund-raising, response management, mitigation activities, and research. Within the framework of the IDNDR and the support of UN/DHA, IFRC, and USAID, CRED organized a working group to discuss specific issues related to the contents of such a database and the criteria and principles governing it. The goal of the workshop was to examine how the several existing databases could be linked together in order to serve a wider audience. The informal working group met in Brussels 7-9 September, 1992. Participants from the following agencies attended: CRED, DHA-UNDRO, the Secretariat of the IDNDR, IFRC, UNEP, USAID/FHA, WFP and WHO/PAHO.

The workshop was conceived as part of the IERRIS initiative aiming at the establishment of a worldwide network of information systems related to disaster management.

The objectives were to

1) discuss the existing databases with respect to the definitions, format, and the use of the data contained;
2) explore complementarity of databases and their processing techniques;
3) form the nucleus of a database network and agree on its scope and functions;
4) establish working mechanisms for the exchange and use of data.

The workshop brought together representatives of government, private, and international agencies that maintain or use disaster-related databases.

A preliminary discussion on the different data collected by the participating agencies as well as their data needs put the issues in perspective. After the initial presentations, the workshop participants proceeded with discussions on the definitions of terms and fields, methodological issues, sources of information, and the practical application of data. The workshop was purposely kept at the size of a small informal working group in order to facilitate discussion and the preparation of a working document.

The draft document produced by the workshop, titled Proposed Principles and Guidelines for the Collection and Dissemination of Disaster Related Data, will be circulated to the participant agencies and other relevant bodies for their comments and modifications. A second workshop on the same issue will then be organized to finalize the guidelines through the participation of a large number of institutions involved in disaster management. The guidelines as approved will thus establish finally an international procedure for the collection and dissemination of disaster-related data.

CONTEXT AND BASIC PRINCIPLES

The growing number of disasters requiring external assistance has prompted new interest in collaborative ventures to effect better donor coordination and a more rational approach to response. Increasingly, the emphasis has been put on preparedness and a "pro-active" response to replace the often ad hoc, reactive approach of the past. Facilitating the exchange of information during disasters and in preparing for disasters is critical to the success of the international partnership and has been one of the goals of recent international workshops.

At a very fundamental level, a thorough knowledge of the vulnerability of developing countries to different types of disasters is necessary for the most effective relief and preparedness planning. The usefulness of a disaster events database as a tool in this planning has become increasingly evident to many government and international agencies engaged in disaster relief as well as in mitigation and prevention programs. Development agencies and international lending institutions are also recognizing the utility of such a database to indicate the vulnerability of countries to natural disasters which might affect programs being planned. An historical database is, of course, only one tool in measuring a country's disaster proneness. Other factors such as the country's coping capacity have to be taken into consideration.

In response to the need for better data on disaster occurrence, a number of databases have been established around the world, independently of one another and with different criteria, formats, and purpose. These databases, while individually useful, have been generally limited in scope and have not been compatible with other existing databases. Inconsistencies and gaps in the data and the ambiguity of terminology make comparisons of the different data sets difficult and inhibits the extraction of basic data characterizing a disaster/emergency situation. This has led to a fair amount of confusion in the perception and evaluation of a disaster situation by the non-experienced public and has been a severe obstacle for the policy planning and fund raising programmes of the institutions involved in the management of disaster/emergency situations. Last but not least, the maintenance of several databases represents considerable duplication of effort and waste of resources crucially needed for other activities in the domain of disaster information management.

On the other hand, establishing a core database on all disaster events occurring in the world is an effort which requires first of all a consistent definition of all the data items which will be included in this register. These definitions have to be kept simple and concrete enough to allow easy collection of these data by field assessment teams and at the same time satisfy the requirements of a broad variety of institutions involved in disaster management. Standard procedures for the collection and reporting of these data also have to be worked out between all participants to this effort. In order to remain a manageable enterprise, the scope of this core database has to be limited to those data characterizing unambiguously a disaster/emergency situation. Each participating institution will continue to maintain a separate database to record whatever specific information about disasters they need for their own purpose. Figure 1 shows a graphical illustration of this concept.

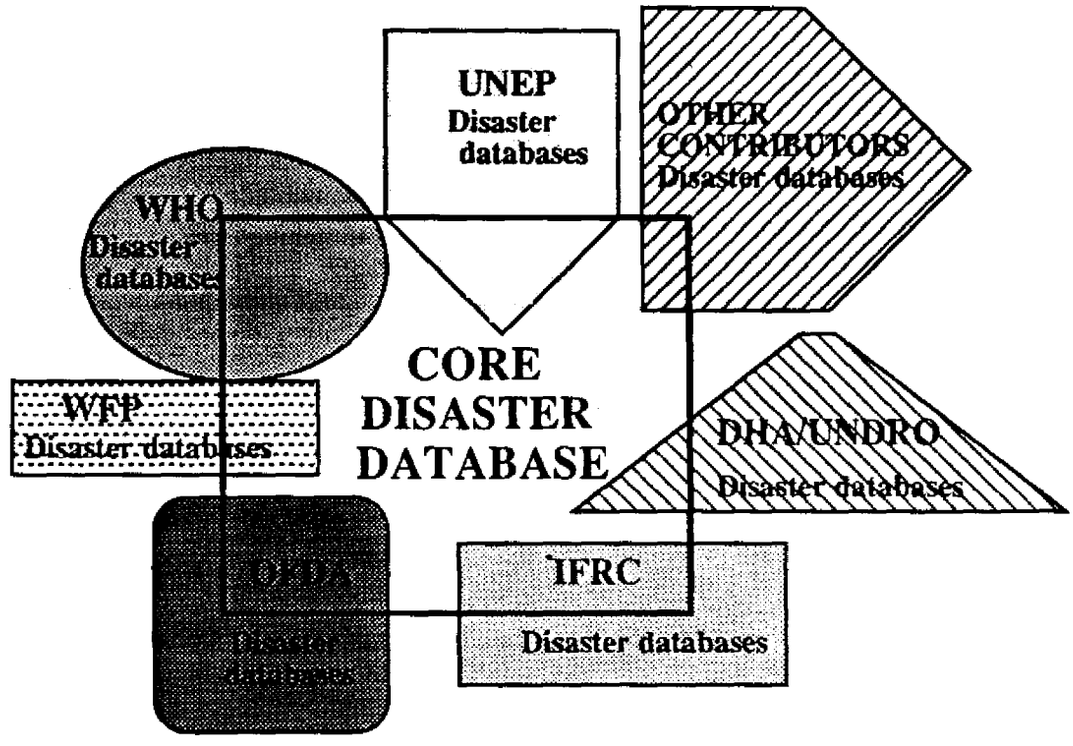

Figure 1: Schematic representation of the Core Disaster Database with contributing databases.

Note: The above diagramme represents contributing databases from organisations present at the workshop; other contributors are welcome to join.

GENERAL CRITERIA FOR THE ENTRY OF A DISASTER EVENT IN A GLOBAL DISASTER DATABASE

The design of a unique Core Disaster Database has to include a variety of disaster data sets common to all types of disasters, both natural and man-made, both sudden onset and long-term. All disasters can be identified by several common elements, such as affected country, human and economic impact, etc. Catastrophic phenomena that affect more than one country are regarded as a combination of specific disasters occurring in each affected country and have therefore to be recorded separately for each affected country. For a long-term disaster spanning over a duration of time, some of the relevant data (e.g., contributions, affected population) will have to be recorded per year while other characteristics (e.g., disaster type, damage) are unique to the disaster and can therefore be stored in one record. In the case of concurrent disasters in the same country or area, events or situations can be linked together, if there is a causal relationship, or identified separately if they require appeals for assistance. For example, cyclonic storms that generate floods can be considered as being part of the same emergency situation, while epidemics occurring several months after a volcanic eruption have to be considered as separate events.

To define what constitutes a disaster, a number of meanings have been set up according to semantic and scientific terminology. However, for the purposes of a Global Disaster Database, a definition must be found that encompasses all disaster types and reflects its significance as distinguished from an unfortunate occurrence.

Therefore, the following definition has been adopted:

> *a disaster is a situation or event which overwhelms local capacity, necessitating a request to the national or international level for external assistance, or is recognized as such by a multilateral agency or by at least two sources, such as national, regional, or international assistance groups and the media*

For example, a situation that did not generate an official appeal for assistance originally from the national Civil Defense Authority, but is identified by the news media or Red Cross as being an emergency, would qualify for entry in the database. This would cover cases in which a government does not recognize a disaster or where the government has collapsed. A situation or event need not require international assistance, such as disasters in many industrialized countries or in China or India which rarely request international assistance, but would still be considered as a disaster since the affected local community receives some form of external assistance.

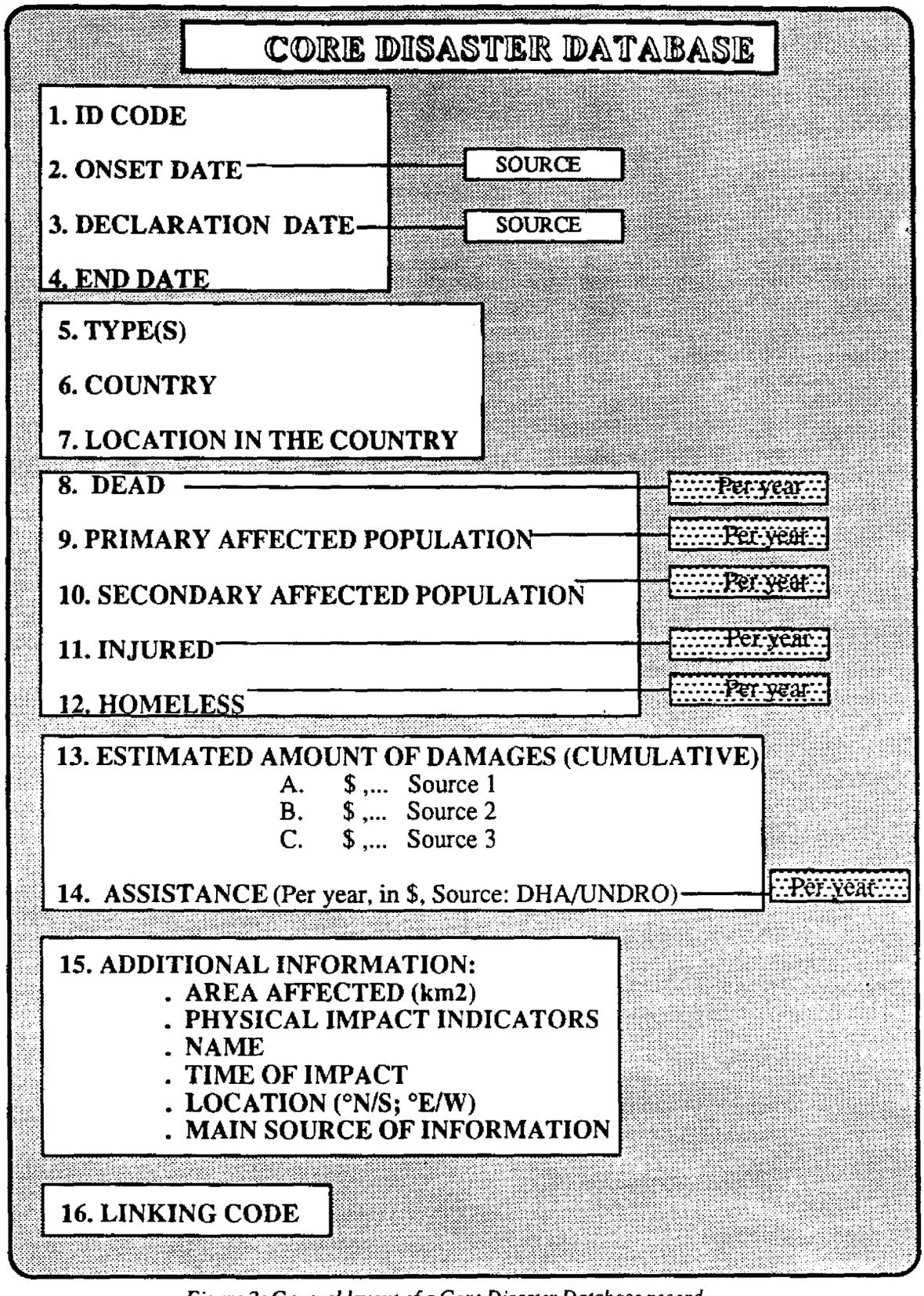

Figure 2: General layout of a Core Disaster Database record

LIST OF PROPOSED DISASTER-RELATED DATA ITEMS TO BE INCLUDED IN THE GLOBAL DISASTER DATABASE

1. Disaster Code

Definition:
A unique identifier characterizing a record in the Core Disaster Database.

Comments:
This code is necessary for technical reasons to be able to identify uniquely each record in the disaster database. It will serve as common key to link the core data base with those of participating agencies.

Recording procedure:
The code will be generated by the institution managing the Global Disaster Database and circulated to all participating institutions.

2. Onset Date

Definition:
The date when the disaster situation occurred.

Comments:
This date is well defined for all sudden-impact disasters, both natural and man-made/technological. For disaster situations developing gradually over a longer time period (e.g., droughts, civil strife) with no definite onset date, this field is left blank.

Recording procedure:
For sudden impact disasters, this date is available from various scientific (meteorology and seismology institutes) and governmental (civil defence authorities) sources. The source of the information will always be recorded together with the date.

3. Declaration Date

Definition:
The date when the first call for external assistance concerning the disaster situation is issued.

Comments:
This call for external assistance mentioned here is defined according to the definition of a disaster situation stated above. Therefore this date is available for all disaster situations to be included in the Core Disaster Database. In case of long term emergency situations, only the date of the first appeal for external assistance will be recorded in this field. All subsequent appeals (e.g., launched on a yearly basis by the UN-agencies) referring to the same disaster will not be recorded in the Core Disaster Database.

Recording procedure:
This date will be communicated to the institution managing the Core Disaster Database by the organization launching the call for assistance (e.g., DHA in case of a consolidated UN-agency Appeal). In a case when, according to the definition, several sources are requested (e.g., Reuters and NGOs), the first date of notification is taken into consideration for entry in the database. The source(s) of information will always be recorded together with the declaration date.

4. End Date

Definition:
The date when all relief activities immediately relating to the disaster situation are completed.

Comments:
This date is somewhat difficult to define due to the fuzzy borderline existing between relief/rehabilitation activities and development programmes. However most of the major organizations involved in disaster relief are basing their activities on projects with a well-defined time frame (mainly for budgetary reasons).

Recording procedure:
All institutions participating in the Core Disaster Database are requested to report the date when their last project of immediate relief assistance to a given disaster situation is completed. The recorded end date will correspond to the last date reported to the institution managing the Core Disaster Database.

5. Disaster Types

Definition:
Description of the disaster according to a pre-defined classification scheme.

Comments:
Disaster types in the Core Disaster Database will include both natural and man-made disasters. For example, natural disasters will include earthquakes, cyclones, floods, volcanic eruptions, drought, and storms; and man-made events will include conflicts (e.g., civil strife, riots) and technological accidents. The criteria for inclusion in the database will be the same for both general types of disasters, as spelled out in the definition of a disaster (see above). Disasters may be further described as sudden onset, such as earthquakes and floods, and long-term, such as drought and some instances of civil strife (See Figure 3). A list of more precise disaster type definitions established by CRED is included in the Annex.
Two or more disasters may be related, or other disaster types may occur as a consequence of a primary event. For example, a cyclone may generate a flood or landslide; or an earthquake may cause a gas line to rupture, causing an ecological disaster.

Recording procedures:
Because two or more disasters may be related, this field will permit multiple entries of disaster types. The primary disaster type will be recorded first, followed by a listing of disaster types that are related to, or occur as a consequence of, the primary disaster type. If each of the related disaster types appeal for assistance, the two (or more) disasters will be treated as discrete events with separate entries in the database. Linking codes (see below) will indicate that the disasters are related. More precise information as to agent (in the case of chemical disasters) or pathogen (in the case of epidemics), for example, will be entered in the Additional Information field (see below). For reports, all disasters can be retrieved by disaster type, whether the disaster is primary or secondary.

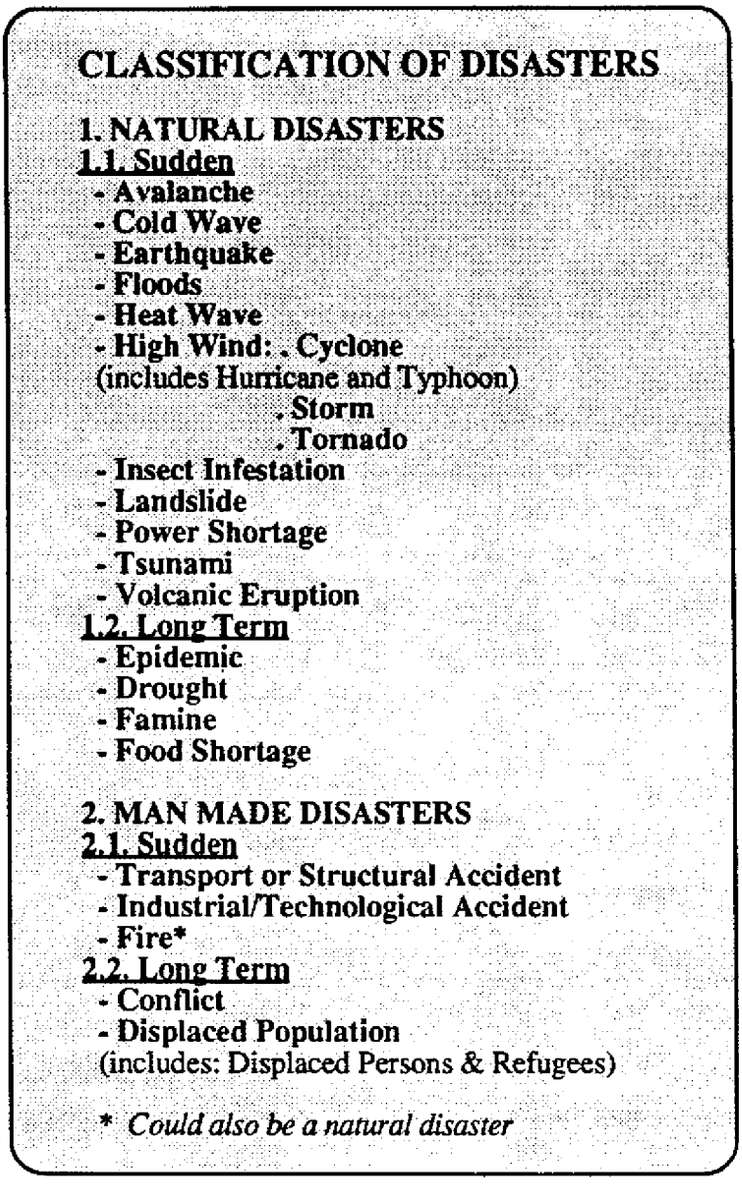

Figure 3: Proposed list of disaster type specifications

6. Country

Definition:
Country in which the disaster occurred.

Comments:
Every disaster record will be by country. Autonomous regions, not yet recognized as countries, will not be used. The same disaster may affect more than one country. For example, a hurricane in the Caribbean may cause damage in several different countries, or a drought in Africa may create catastrophic food shortages across a wide region.

Recording procedures:
The name of the country in which the disaster occurred will be entered, the name (spelling) as it appears on the standard list of country names published by the International Standards Organization (ISO). Only one country name can be entered in this field. If the same disaster has affected more than one country to the degree that a disaster situation is recognized to exist in each country, separate records will be entered for each country. Linking codes (see below) will indicate that the disasters are related.

7. Location in the Country

Definition:
A more precise location of where the disaster occurred in the affected country.

Comments:
Location may include province, city(ies), village(s), or other location identifier. Because the disaster may become known by its location --e.g., Bhopal, Chernobyl, Tangshan, or Mt. Pinatubo-- the recording of the location can be a useful identifier. The location can also help differentiate between disasters of the same type occurring at about the same time in a large country, such as the People's Republic of China or India.

Recording procedures:
Several locations, from the more general to the more specific, can be recorded. This is a descriptive field and the data will be retrievable by a search command.

8. Dead

Definition:
Persons confirmed dead and persons missing and presumed dead (official figures when available).

Comments:
The number of missing is usually not included in the "dead" figure if the source used gives preliminary figures. The figure has accordingly to be updated as missing persons are determined to be dead. The figure is expected to be exclusive.

Recording procedure:
In the Core Disaster Database, long-term disasters are entered only once, even if they occur over several years. For each event a sub-file will be created to enter the number of dead per year, if available.

9. Primary Affected Population

Definition:
People requiring immediate assistance during an emergency situation.

Comments:
Immediate assistance means meeting basic "life-line" needs, such as food, water, shelter, sanitation and immediate medical assistance. This information has to be available as soon as possible for the launching of appeals. For epidemics, all persons who have contracted the disease and fallen ill but have not died from it will be considered as primary affected. It is important to distinguish "primary affected" populations from the following categories of populations concerned by the disaster:

exposed population:
the total population potentially susceptible to the effects of a hazard
population at risk:
population whose life, property and livelihood are directly threatened by a hazard.
target population:
the group of people to whom relief services and supplies are provided.

Recording procedure:
Specific information about this population will have to be included in the field situation reports. Determining realistic numbers will be the responsibility of the assessment team co-ordinating the response to a disaster situation. In the Core Disaster Database, long-term disasters are entered as one single record, even if they occur over several years. For each event a sub-file will be created to record the number of primary affected population per year, if available.

10. Secondary affected population

Definition:
People who at a certain point will require long-term social and economic assistance as a direct consequence of a disaster situation.

Comments:
The assistance could include agricultural support (e.g. seeds and tools), housing and infrastructure rehabilitation, environmental clean-up and medical rehabilitation. The category of "secondary affected" population includes the "primary affected" population (see figure 4).

Recording procedure:
Determining realistic numbers for this category will be the responsibility of the field assessment team. In the Core Disaster Database, long-term disasters are entered as one single record, even if they occur over several years. For each event a sub-file will be created to record the number of secondary affected population per year, if available.

11. Injured

Definition:
People with physical injuries/trauma/illness requiring medical treatment (therapeutic feeding included) as a direct result of a disaster.

Comments:
This category will include the severely malnourished as well as victims of radiation exposure and chemical intoxication. The injured are always part of the primary affected population (see figure 4).

Recording procedure:
Determining realistic numbers for this category will be the responsibility of the field assessment team. In the Core Disaster Database, long-term disasters are entered as one single record, even if they occur over several years. For each event a sub-file will be created to record the number of injured population per year, if available.

12. Homeless

Definition:
People needing immediate assistance with shelter.

Comments:
The definition applies also to displaced populations/refugees to which shelter has to be provided. This figure is necessary for operational purposes. Homeless people are always part of the primary affected population (see figure 4.)

Recording procedure:
Reporting from the field should give the number of individuals that are homeless; if only the number of families is reported, the figure can be multiplied by the average family size for the affected area. Field reports may also give the number of houses destroyed or other data, but the homeless figure (number of individuals) is the minimum information required. In the Core Disaster Database, long-term disasters are entered as one single record, even if they occur over several years. For each event a sub-file will be created to record the number of homeless population per year, if available.

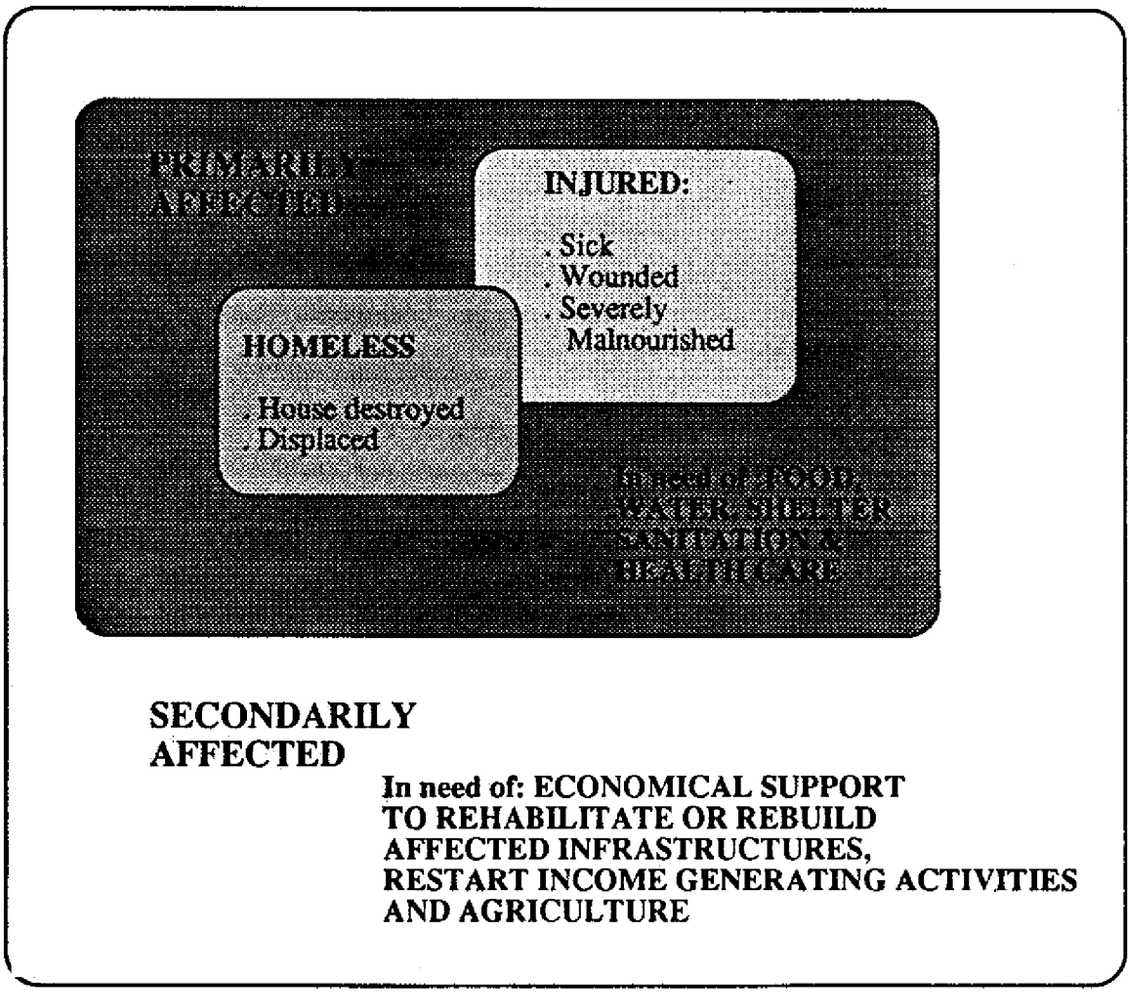

Figure 4: Graphic representation of affected populations in disaster situations.

13. Estimated Amount of Damage

Definition:
A value (in US$) of all damages and economic losses directly related to the occurrence of a given disaster situation.

Comments:
The economic impact of a disaster usually consists of direct (e.g., damage to infrastructure, crops, housing) and indirect (e.g., loss of revenues, unemployment, market destabilization) consequences on the local economy. Although several institutions have developed methodologies to quantify these losses in their specific domain, no standard procedure to determine a global figure for the economic impact exists up to now. On the other hand, this figure is an important element for public information and fund raising programmes. Due to the lack of a reliable single figure, three different figures will be recorded from those sources which have a well-defined methodology for the assessment of economic impacts. This includes the World Bank and other international lending agencies, the host government and, especially in the case of complex emergency situations, the total budget requirements listed in the consolidated appeals launched by the UN agencies and other major NGOs (e.g., the IFRC appeals).

Recording procedure:
Each organization participating in the Core Disaster Database will communicate, whenever available, a global figure (in US$) for the estimated amount of damage together with a short description of the methodology used to determine that figure. The institution managing the Core Disaster Database will have the responsibility to select out of these data, three figures for inclusion in the database, one of them being always the estimate given by the host government. These figures will always be recorded together with the source of information. No unique figure will be produced out of these data; the various reported values will always be given in answer to all outside requests.

14. Assistance

Definition:
The total amount (in US$) of contributions for immediate relief activities given to a country in response to a disaster situation.

Comments:
It is very difficult to provide a reliable estimation of the total amount of contributions spent in response to a given disaster situation. This is mainly due to the fact that contributions issued by donors are usually channelled through various institutions (e.g., bilaterally, NGOs, UN-agencies,...) before arriving in the field This results in important delays between the pledges announced and the contribution reported by an organization working at the disaster site. No standard procedure exists up to now for reporting contributions received to which all institutions involved in disaster management adhere. The only global figure available at present is extracted from the reports made by the donors to DHA-UNDRO about their pledges in response to a particular disaster situation. These reports are made using a standardized 14-point format which is now widely accepted in the donor community. In some cases, reliable figures can also be obtained from the host government.

Recording procedure:
For the present time, the figure reported by DHA-UNDRO based on the information received by the donors will be included in the Core Disaster Database. For long-term disasters, a separate figure will be recorded for each calendar year.

15. Additional Information

Definition:
This memo field provides additional information on the disaster, including a possible variety of standard data elements, depending on the type of disaster, such as: scientific indicator, e.g., Richter Scale or wind speed; disaster agent, such as pathogen, vector or contaminant; name of disaster, e.g., Hurricane "Andrew"; area affected (km2); location (latitude and longitude); time of event; main source of information; and other descriptive data.

Comments:
This memo field contains mostly descriptive information on the disaster, but would be searchable by retrieving certain identifiers. For example, the user could retrieve all records containing an identifier, such as Hurricane "Hugo", without having to search under country or disaster type. Name of disaster might also refer to the designated name of the volcano or some commonly recognized identifier. As a memo field, it would have more character space for inclusion of descriptive information, but a limit would be set to discourage entry of descriptive text that could be found in other documents. Sources of additional information could be included to point the user to other information resources. This memo field could also include any additional comments that could be relevant to the user.

Recording procedure:
Additional information can be provided by a wide variety of sources. For example, scientific indicators and the time and exact location of the event will be provided by scientific or technical organizations, such as the World Meteorological Organization or the U.S. Geological Survey. Names of all cyclonic storms are designated by the World Meteorological Organization.

16. Linking Code

Definition:
An identifier used to link together records belonging to the same disaster situation.

Comments:
Some disaster situations cover several countries, such as the complex emergency situation related to the drought in Southern Africa. However since the definition of regions is not standardized and due to the fact that for statistical purposes, a breakdown of disaster-related information by country is needed, a regional disaster will be entered using a separate record for each country affected by the emergency. In order to be able to produce global information about the whole emergency situation, a common linking code has to be defined which will be used to group together all records related to the same disaster.

Recording procedure:
The code will be generated automatically by the Core Database. This code will not contain in itself any information related to the disaster in order to avoid confusion. Where the disaster occured in several countries, the code will be entered in a specific table where all codes of records related to a given disaster will be entered together with the name of the disaster, thus allowing the extract all (country) records related to one particular disaster.

RECOMMENDATIONS

I. Based on the experience gained with the Disaster Events Database, it is recommended that an institution with the appropriate scientific and technical expertise take the role of managing Core Disaster Database. All organizations participating in this effort should provide the necessary support for the design, development and maintenance of a Core Disaster Database. A multi-agency support for maintaining and providing this information service should be envisaged for all organizations interested in participating in such an initiative.

I.1. Participating agencies in the Core Disaster Database should establish a systematic network for continued exchange of information and technical collaboration.

I.2. The organizations and institutions involved in the provision of disaster data to the Core Disaster Database should be encouraged to arrive at common agreements on standardized reporting procedures, e.g., DHA-UNDRO's 14-point Contributions Reporting format, assessment guidelines, etc.

I.3. All participating organizations should agree on common technical standards facilitating the on-line access of their disaster-related databases through computer networks such as UNIENET.

1.4. A relational database using RDBMS principles is essential to effectively manage and process the compiled disaster data sets. The design of the existing Disaster Events Database can and should be modified to meet the needs of the proposed Core Disaster Database.

II. Recognizing that economic indicators of disaster damage are imprecise, an expert consultation to standardize the various methodologies for calculating the economic impact/damage of disasters should be organized to give greater coherence to the process of collecting data for the category of Estimated Amount of Damage.

III. This present document should be circulated to all organizations involved in disaster management for review. A final version of the document should be discussed and adopted during a second workshop gathering together all institutions wishing to participate in the initiative of setting up a Core Disaster Database.

IV. The disaster data that can be retrieved from the Core Disaster Database should be made available to agencies involved in disaster-related activities, as well as to individuals and institutions engaged in fields of disaster research. The practical application of this data for use in vulnerability assessment, strategic and budgetary planning, disaster response management, and trend analysis should be promoted, once authoritative criteria are agreed upon.

ANNEX 1.

LIST OF DISCUSSION ITEMS

1. Participants described their systems (current or planned), the contents, and their desideratas. This included the presentation of projects such as A Supply Management Project in the Aftermath of Disasters in Latin America and the Caribbean - SUMA (PAHO), DALIS (OFDA) and Interfais (WFP).

2. Definition of a disaster and criteria for entering a disaster on a Core Disaster Database.

3. Database contents and design: fields to include in the database.

4. Minimum contents (list of variables) of a database as regards human impact, physical impact, economic impact, and donor response. Definitions of "dead," "affected," "injured," and "homeless," and discussion of "damage" and donor contributions

5. Classification of disasters by chronic and acute categories and how to record each in the database. Discussion of disaster types.

6. How to record related disasters and those with indirect or secondary impacts. How to indicate linkage of disasters in the database.

7. How to date an event in the database: date of onset, date of declaration, end date.

ANNEX 2.

LIST OF PARTICIPANTS

-	Department of Humanitarian Affairs/UNDRO	Mr. M. Warns
-	Department of Humanitarian Affairs/IDNDR secretariat	Ms. T.Katila
-	International Federation of Red Cross and Red Crescent Societies	Mr. JP.Revel
-	United Nations Environment Programme	Mr. M.Getzendanner
-	Université Catholique de Louvain/Centre for Research on the Epidemiology of Disasters	Ms. D.Sapir Ms. C.Misson Ms. H.Deconinck
-	Volunteers in Technical Assistance	Ms. S. Brooks
-	USAID/Office of Foreign Disaster Assistance	Ms. F.Henderson Mr. D.King
-	WHO/Pan American Health Organisation	Mr. M.Thieren
-	World Food Programme	Mr. G.Simon

ANNEX 3.

LIST OF DISASTER TYPES

The following definitions have developed as a result of detailed discussions with technical staff in UNDRO and the World Meteorological Organization. The Scientific Technical Committee of the IDNDR in the past year has contributed significantly to the formulation of these terms. The responsibility for these definitions remains however, entirely with CRED.

1. NATURAL DISASTERS

1.1 SUDDEN

1.1.1 Avalanche

Rapid and sudden sliding and flowing of masses of usually incoherent and unsorted mixtures of snow/ice/rock material.

1.1.2 Cold Wave

Long lasting period with extremely low surface temperature.

1.1.3 Earthquake

Sudden break within the upper layers of the earth, sometimes breaking the surface, resulting in the vibration of the ground, when strong enough will cause the collapse of buildings and destruction of life and property. There are two scales for measuring the impact of an earthquake; the Richter scale and the Mercalli scale.

Aftershock: a smaller earthquake that follows the main shock and originates close to its focus. Aftershocks generally decrease in number and magnitude over time. Aftershocks that follow the main shock have to be considered as the same event as the main earthquake.

1.1.4 Floods

Significant rise of water level in a stream, lake reservoir or a coastal region. A flood is a harmful inundation of property and land utilized by man and may be of two types:

Slow flood: caused by an increase in the volume of water produced by rain in rivers and lakes over a long period - days or weeks, mainly affecting property such as houses and cattle, and displace the inhabitants from their usual dwelling places;

Sudden flood: caused by an increase in the volume of water in rivers and lakes, causing deaths, injuries and violent destruction of property. It may be the result of torrential rain, cyclones, structural failures such as the collapse of walls of a reservoir or the embankment of a river proving insufficiently robust to contain the strong flow of water.

Flash flood is a sudden and extreme volume of water that flows rapidly and causes inundation, and because of its nature is difficult to forecast.

Dam Collapse may be caused by a shifting of a dam foundation after an earthquake, nearby oil drilling or due to faulty construction. Earth dams are more likely to collapse when excessive rainfall fills the reservoir to overflowing. The excess water then pours over the top of the dam, gradually washing it down and cutting deep channels into it. This weakens the entire structure so that it then gives way entirely. The result of

a dam collapse is a sudden release of large amounts of water which sweep over low-lying villages, causing many deaths and injuries.

1.1.5 Heat wave

Long lasting period with extremely high surface temperature

1.1.6 High Wind

* *Cyclone*

This type includes Hurricane and Typhoon.

Large-scale closed circulation system in the atmosphere with low barometric pressure and strong winds that rotate counter clockwise in the northern hemisphere and clockwise in the southern hemisphere. The system is referred to as a cyclone in the Indian ocean and South Pacific, hurricane in the western Atlantic and eastern Pacific and typhoon in the western Pacific. Hurricanes and typhoons are the same storm types as tropical cyclones. They are the local names for storms which originate in the Caribbean and China Sea region respectively. Hurricanes are large atmospheric vortices with wind speeds of more than 100 km/h; they develop in the doldrums of the tropics and move in an often erratic way towards higher latitudes. See Cyclones.

* *Storm*

Atmospheric disturbance involving perturbations of the prevailing pressure and wind fields, on scale ranging from tornadoes (1km across) to extra tropical cyclone (2-3000km across)

Hail: derives from the impact of hailstones, precipitated particles of ice and is most commonly associated with thunderstorms;

Sand storm: dust or sand energetically lifted to great heights by strong and turbulent winds;

Storm surges: a sudden rise of sea as a result of high winds and low atmosphere pressure; sometimes called a storm tide, storm wave or tidal wave (this name, indicates waves caused by the tidal action of the moon and the sun in the same way as regular ocean tides. It is often erroneously given to tsunamis). Generally affects only coastal areas but may intrude some distance inland;

Thunderstorm: a large cumulus cloud on which localized centres of electrical charge have developed;

Tropical storm: formed over open seas and is characterized by extreme wind damage, intense downpours of rain, wave storms at sea, severe coastal wave action, marine flooding, riverine flooding, lightning and thunderstorms.

* *Tornado*

Localized and violently destructive windstorm occurring over land. Characterized by a long funnel-shaped cloud composed of condensation and debris extending to the ground and marking a path of greatest destruction

1.1.7. Insect infestation or animal infestation

Pervasive influx and development of insects or parasites affecting humans, animals, crops and materials

1.1.8. Landslide

Downhill sliding or falling movement of dry soil and rock.

Landslides are difficult to estimate as an independent phenomenon. It seems appropriate, therefore, to associate landslides with other hazards such as tropical cyclones, severe local storms and river floods. The term "landslide" is used in its broad sense to include downward and outward movement of slope-forming materials - natural rock and soil. It is caused by heavy rain, soil erosion and earth tremors and may also happen in areas under heavy snow (avalanches).

Earth flow: a mass movement characterized by slow down-slope translation of soil and weathered rock within a landslide

1.1.9. Power shortage

Total or partial disruption of electrical power for an extended period causing significant damage to services and normal livelihood.

1.1.10. Tsunami and tidal wave

Series of large sea waves generated by sudden displacement of seawater (caused by earthquake, volcanic eruption or submarine landslide); capable of propagation over large distance

1.1.11. Volcanic eruption

Discharge of fragmentary ejecta, lava and gases from a volcanic vent.

The most common consequences are displacement of population, temporary food shortage and volcanic ash landslides called lahar.

Glowing Avalanches: hot pyroclastic flows formed from freshly erupted magma, with temperatures of up to 1,200 degrees. The pyroclastic flow is formed from rock fragments derived from a volcanic explosion which, when suspended in a cloud of rapidly expanding gas and dust surges down the flanks of the volcano at speeds of up to several hundred kilometers per hour, to distances often up to 10 km, and rarely as far as 40 km from the event. This is the most dangerous type of volcanic eruption.

1.2 LONG TERM

1.2.1. Epidemic

An unusual increase in the number of cases of an infectious disease which already exists in the region or population concerned. The appearance of a significant number of cases of an infectious disease introduced in a region or population that is usually free from that disease Epidemics may be the consequence of disasters of another kind, such as tropical storms, floods, earthquakes, droughts, etc. Epidemics may also attack animals, causing local economic disasters.

The nine common epidemics are: cholera, diphtheria, dysentery, haemorrhagic fevers, infectious diseases, malaria, parasitic diseases, typhus, typhoid fever, yellow fever.

1.2.2. Drought

Period of deficiency of moisture in the soil such that there is inadequate water required for plants, animals and human beings

A drought causes malnutrition, epidemics and displacement of populations from one area to another.

Desertification: the processes by which an already arid area becomes even more barren, less capable or retaining vegetation, and progressing towards becoming a desert. This is often a cause of long-term disasters.

This type of disaster will normally be entered as a consequence.

1.2.3. Famine or hunger

Catastrophic food shortage affecting large numbers of people due to climatic, environmental and socio-economic reasons

The cause of the famine may produce great migrations to less-affected regions.

1.1.4. Food shortage or crop failure

Abnormal reduction in crop yield such that it is insufficient to meet the nutritional or economic needs of the community

This type of disaster is always a consequence of another disaster type and will therefore be classified under the major cause.