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ACTIVITIES FOR NATURAL DISASTER REDUCTION

International Decade for Natural Disaster Reduction

Report of the Secretary-General of the Conference

Addendum

Annex I

DISASTERS AROUND THE WORLD: A GLOBAL AND REGIONAL VIEW a/

I. Objective of the Study

One normally has a general perception of the vulnerability of a given country or region to natural disasters. This perception is usually based on the memory of the occurrence in the recent past of one or more disasters there which appeared to be reasonably serious, especially those which received wide press coverage. Thus, the criteria generally used to arrive at such conclusions are often neither quantitative nor objective, and tend not to take into account the long-term history of disasters in the area, nor the degree to which the economies and the populations of the countries in the region can absorb the effects of those disasters.

The overall purpose of the study carried out for this report is to give an objective graphical picture of this critical situation based on historical evidence, and to point out trends in the vulnerability of countries both worldwide and on a regional and subregional basis. In this way it can provide guidance to governments, disaster managers and researchers as to where current problems lie, and to identify future problems where disaster mitigation efforts would be most fruitful. For, as this study illustrates graphically, disaster mitigation efforts in the most vulnerable areas of the world are an essential step in ameliorating the effects of disasters, thus providing a viable platform for continuing sustainable development in those areas.

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* A/CONF.172/1.

a/ The present annex provides a brief summary of the study, full details of which are available to participants as an information report under the same title.

II. General Considerations

A. Time Span

To obtain a reasonable and statistically significant basis for the study reported here, a 30-year period, from 1 January 1963 to 31 December 1992, was decided upon. All natural disasters which occurred worldwide during this period, and for which sufficient information was available, were included in the study. This data has been analysed to indicate the number of occurrences, their location, and their negative effects. Some of the analysis is global, covering the entire period. In order to distinguish possible trends in the development of disasters within this time span, other statistics are based on an analysis of disasters within each of the six five-year "windows" within this 30-year period. Both worldwide and regional analyses were carried out.

B. Disaster Types/Effects Considered

Only natural disasters are considered in this study (the only possible exception being fires, some of which are man-made and some naturally occurring; because of the difficulty in determining which were the result of strictly natural causes, all have been included). Table 1 gives the types of disasters considered, in alphabetical order, along with their abbreviations as used in the graphs and charts included in this Annex. More than 5,000 disasters were analysed on the basis of date, type of disaster, location, damage caused, number of people affected, and number of deaths caused.

Table 1: Disaster Types

ABBREVIATION	DISASTER TYPE
AVL	Avalanche
CWV	Cold Wave
DRO	Drought
EPI	Epidemic
EQU	Earthquake
FAM	Food Shortage/Famine
FIR	Fire
FLO	Flood
INS	Insect Infestation
LAN	Landslide
HWV	Heat Wave
STO	Storm (Not tropical)
TRS	Tropical Storm (Hurricane, Cyclone, Typhoon)
TSU	Tsunami
VOL	Volcanic Eruption

C. Countries/Regions Considered

Some 195 countries were examined in this study. Sufficient information was available or could be estimated to include more than 5,000 disasters in 179 of those countries. For purposes of analysis, these 179 countries have been grouped into 13 unofficial regions, defined solely for this study. These regions are strictly geographical and are in no way meant to carry any political implications. They were selected exclusively on the basis of common disaster occurrence, in order to give as fine a regional breakdown as possible of the location of the disasters under consideration.

III. Methodology

A. General

Clearly, the overall effect of a disaster on a given country, and its ability to absorb the resulting damage and recover, depends on several factors. Among these, certainly the economy of the country and its population play significant roles. A disaster affecting a certain number of people and causing a certain amount of damage may have a disastrous effect on a country with a small population and a weak economy, whereas a disaster of similar magnitude in another country with a strong economy and a large population might not be considered serious at all. Therefore, in this study three factors were examined for each disaster for which sufficient information was available or could be estimated; namely, damage in relation to the total annual Gross National Product (GNP) of the stricken country, the number of people affected in relation to its total population, and the number of deaths caused.

B. Selection Criteria

Of the more than 5,000 disasters for which information was collected for the study, only those which met certain criteria were considered as "significant" disasters, based on the factors mentioned in the preceding paragraph. Those disasters were grouped into three categories according to three different criteria; namely those which caused significant damage, those which affected a significant percentage of the total population of the stricken country, and those which caused a certain number of deaths. Specifically, disasters were selected for analysis in the three categories according to the following criteria:

Table 2: Disaster Categories/Criteria

CATEGORY	CRITERION
Significant Damage	Damage of 1% or more of total annual GNP
Number of Affected People	1% or more of the total population
Number of Deaths	100 or more

IV. Results of the Study

The major results of the study are summarized and illustrated graphically in the charts and graphs on the following pages. A description of these and some remarks on what results they show follows:

Figure 1 gives the number of significant disasters in the three categories over the 30-year period, broken down into five-year windows. It clearly illustrates an increasing trend of vulnerability to major disasters of all three types worldwide over time.

Figure 2 shows the number of each type of significant disaster in each of the three categories over the entire 30-year period of the study, and Figure 3 shows the percentages of such disaster types in each category. Together they show that floods, tropical storms, drought and earthquakes are the most damaging individually to the economies of the stricken countries; that drought, tropical storms and floods affect the largest numbers of people per disaster; and that floods, tropical storms, epidemics and earthquakes cause the highest numbers of deaths per disaster. Overall they illustrate that floods and tropical storms are the most damaging in that they represent the overwhelming majority of occurrences with significant effects in all three categories.

Figure 4 is a refinement of the information in Figure 2 and Figure 3, showing certain statistical trends. It gives information on the major types of significant disasters in each category, as described in the preceding paragraph. That is, every type of disaster which represents 10 per cent or more of the total significant disaster occurrences over the 30-year period in each category is included. The number of occurrences of each of those types of disasters was plotted over six five-year windows for each category, and the resulting trends which that information represents are computed statistically and illustrated in the graphs for each disaster type and category.

Figure 4 clearly illustrates that the number of floods, tropical storms and drought which cause significant damage have been increasing at a rather steep rate over the six five-year windows of the 30-year period 1963-1992. Significant earthquakes also show a growing trend, but at a rather slow rate of increase. As to disasters which affect a significant number of people, the chart shows that the number of floods and tropical storms responsible for such disasters is also increasing at a rather steep rate, with the number of such droughts increasing much slower. The last of the three charts in Figure 4 suggests a strong trend of increasing epidemics around the world causing 100 or more deaths. A second increasing trend can be discerned in this category for floods, also at a fairly steep rate, but not as steep as for epidemics. On the other hand, the rate of increase for both tropical storms and earthquakes in this category is nearly flat.

Figure 5 is a world map on which has been superimposed the total number of disasters in the three categories over the entire 30-year period for each of the regions defined in the study. In numbers alone, it illustrates that there is no region of the world which is entirely safe from significant

disasters. (Note that the "Worldwide" entry shown was a widespread cholera epidemic in 1970, which caused more than 4,500 deaths in 50 countries; thus, it could not be included in any single region.)

V. Conclusions

Unfortunately, as this study illustrates clearly, both the number and the effects of natural disasters around the world continue to worsen over time. This is especially true among developing countries. For some years now, total annual losses from disasters have exceeded the amount of international assistance available to cope with them. The number of disasters which strike continues to grow. In recent years, the number of persons affected by these disasters has been increasing at the rate of 6 per cent per year, which corresponds to three times the annual population growth. Along with ever-mounting economic losses, the inevitable result is a serious negative impact on sustainable development.

The study shows that the past 30-years have seen a steady and rapid increase in the number of significant natural disasters. The trend is for their number and the magnitude of their effects to continue to increase at a rapid rate in the future, especially for certain types of devastating disasters. This appears to be particularly true, although not exclusively, for floods and tropical storms, both of which cross the boundaries of the types of negative effects which they encumber. The main conclusion of the study, therefore, is that efforts in the area of disaster reduction must be strengthened if there is to be any hope for sustainable development around the world, in developing countries in particular. For, as stated in the objectives, "as this study illustrates graphically, disaster mitigation efforts in the most vulnerable areas of the world are an essential step in ameliorating the effects of disasters, thus providing a viable platform for continuing sustainable development in those areas".

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MAJOR DISASTERS AROUND THE WORLD, 1963-1992

Significant Disasters Based on: Damage, Affected Persons, Deaths

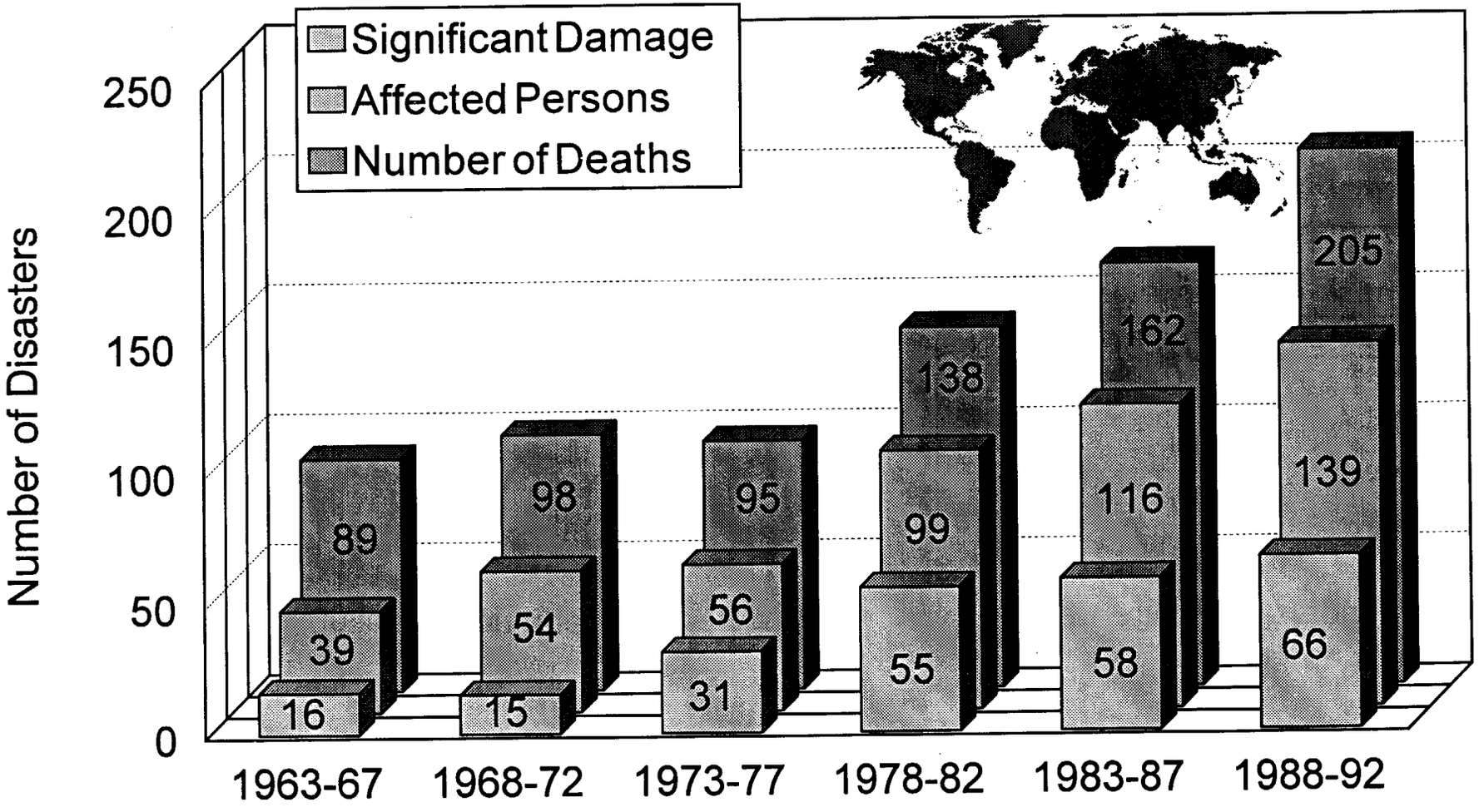
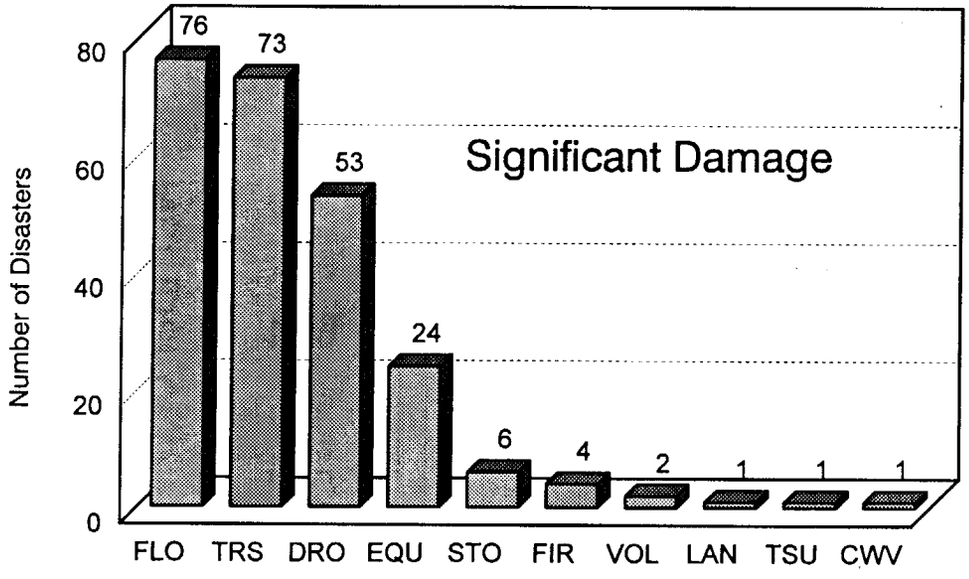
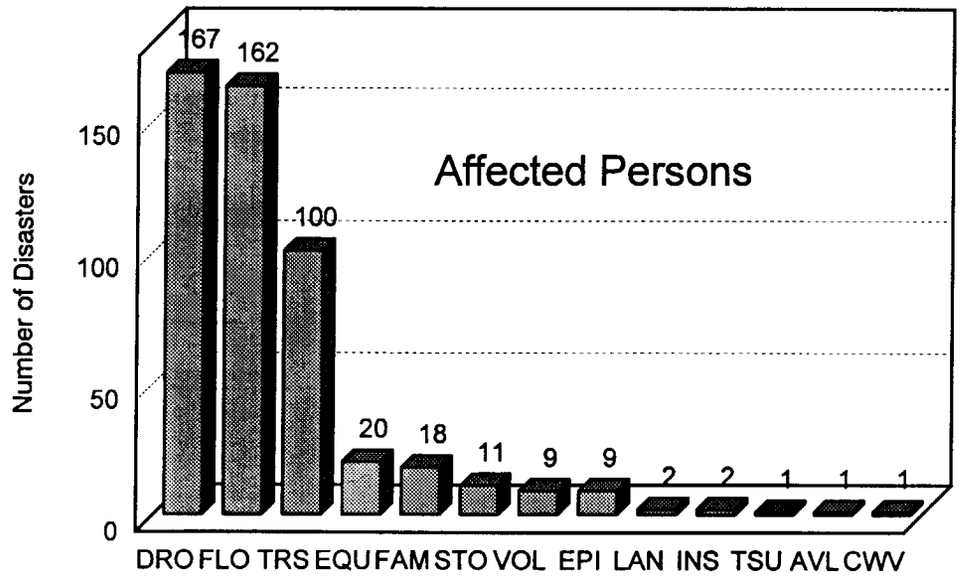


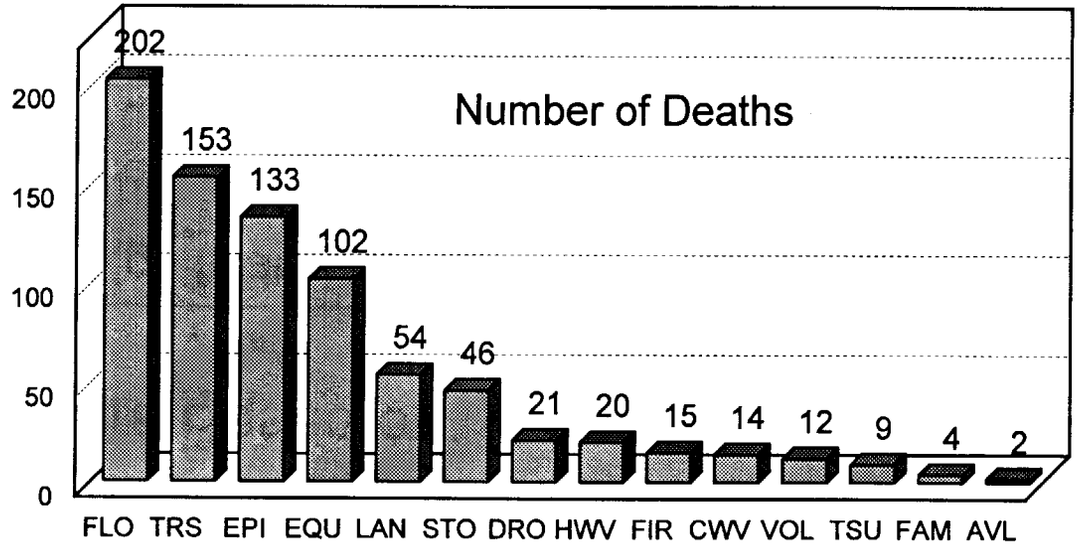
Figure 1

MAJOR DISASTERS AROUND THE WORLD, 1963-1992

Number of Significant Disasters by Type, Based on: Damage, Persons Affected, Deaths







KEY:

FLO = Floods
TRS = Tropical Storms
DRO = Drought
EQU = Earthquakes
STO = Storms, Other
FIR = Fires
VOL = Volcanos
FAM = Famine/Food Shortage
EPI = Epidemic
LAN = Landslide
TSU = Tsunami
AVL = Avalanche
CWV = Cold Wave
HWV = Heat Wave
INS = Insect Infestation

Figure 2

MAJOR DISASTERS AROUND THE WORLD, 1963-1992

% of Significant Disasters by Type, Based on: Damage, Persons Affected, Deaths

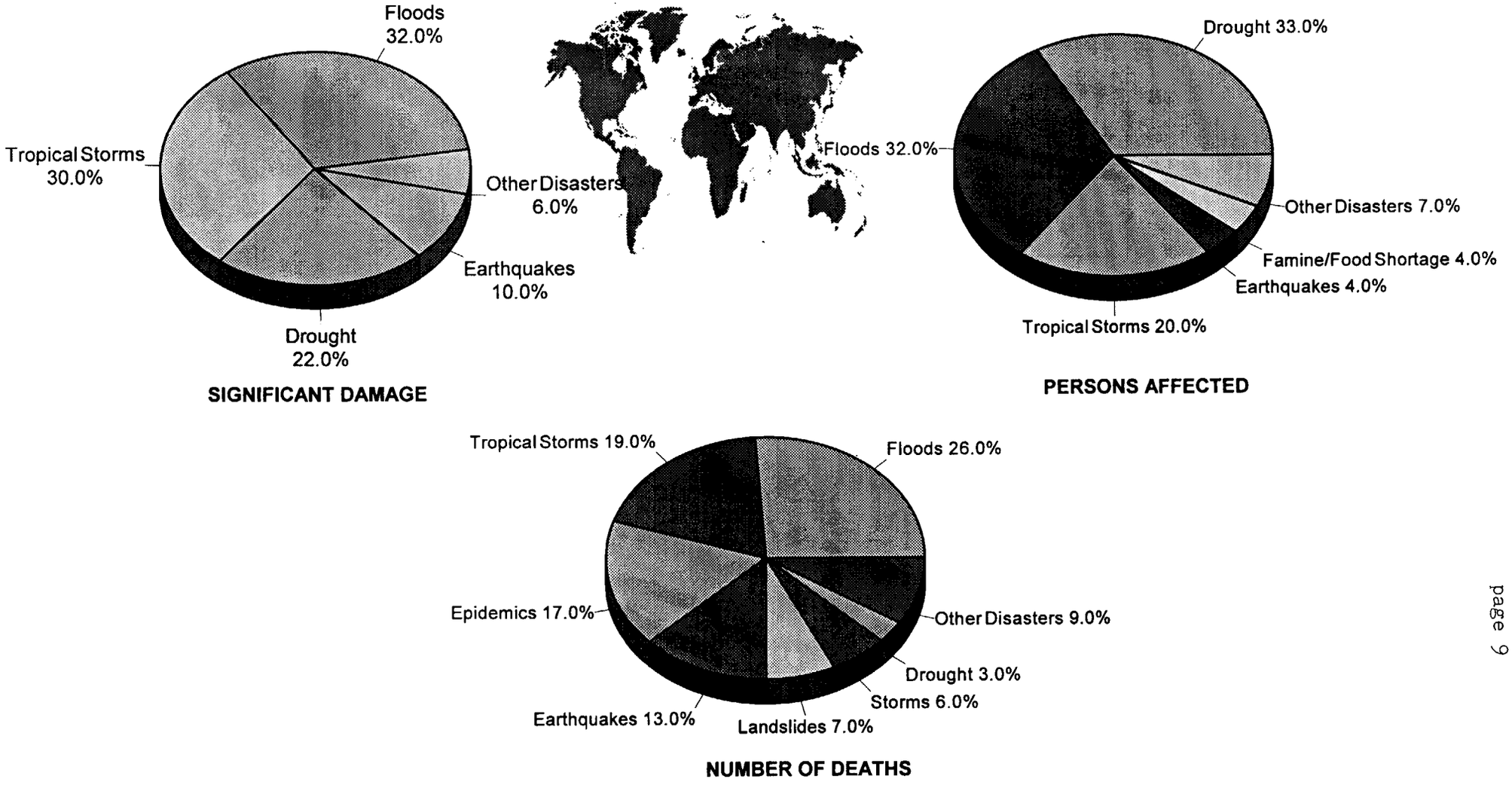
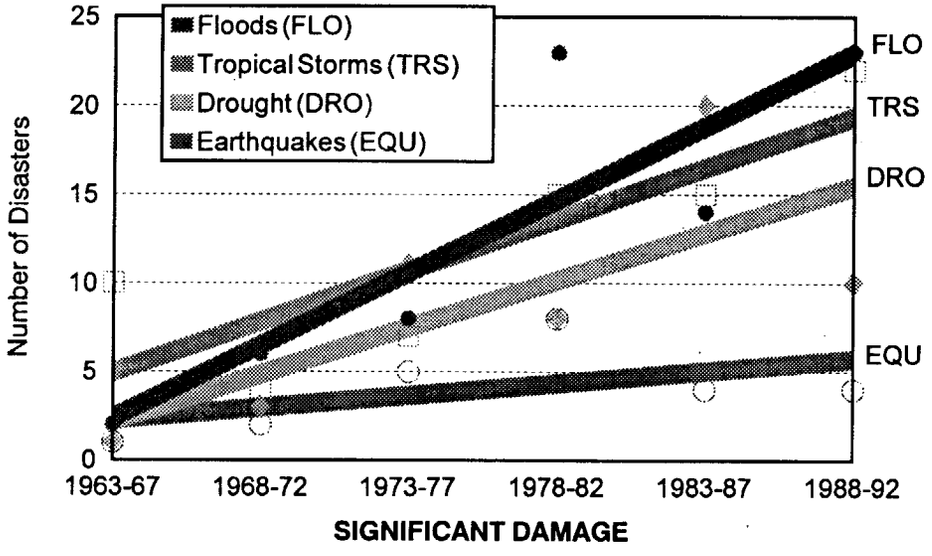
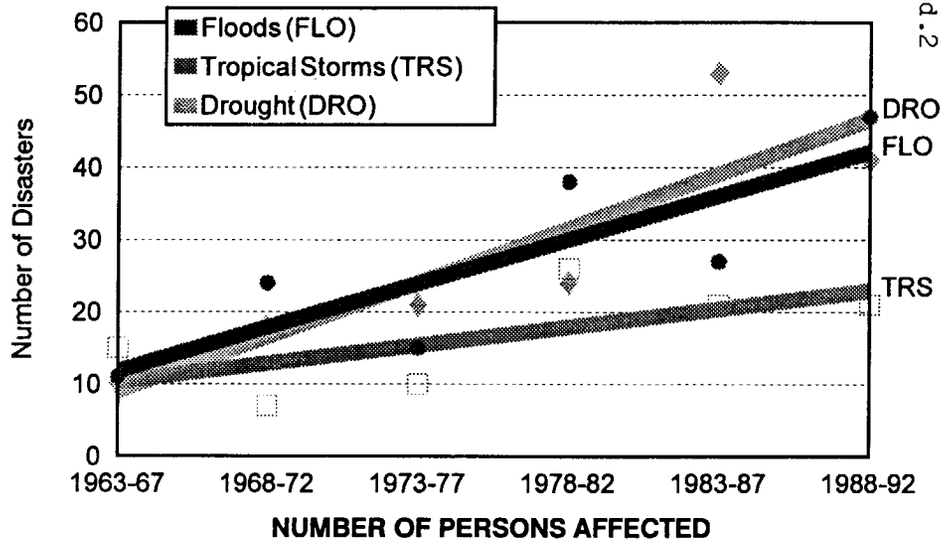


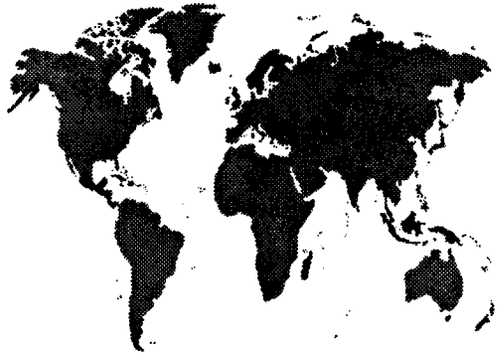
Figure 3

MAJOR DISASTERS AROUND THE WORLD

Trends: Most Significant Disaster Types by Category







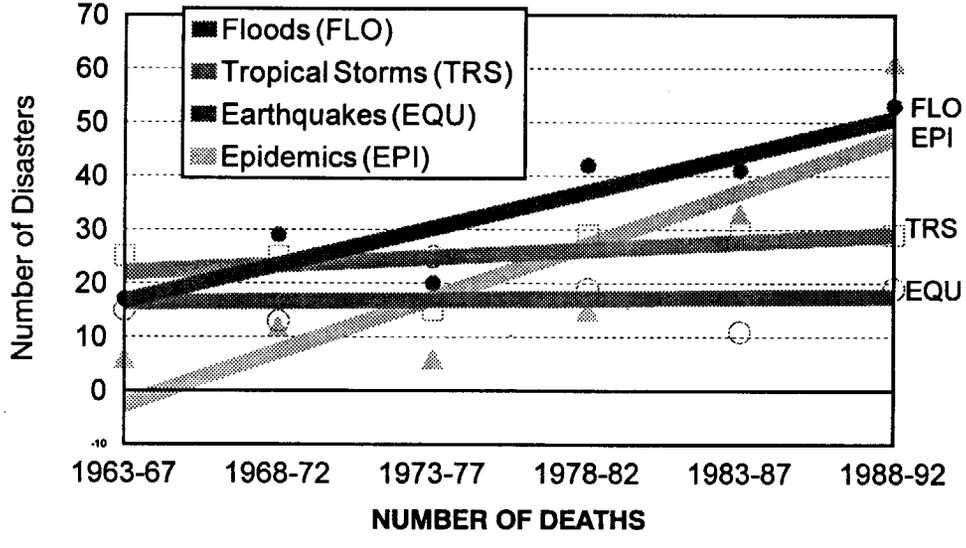


Figure 4

MAJOR DISASTERS AROUND THE WORLD, 1963-1992

Major Disasters by Region, Based on: Significant Damage (SD), No. Affected (AF), No. of Deaths (ND)

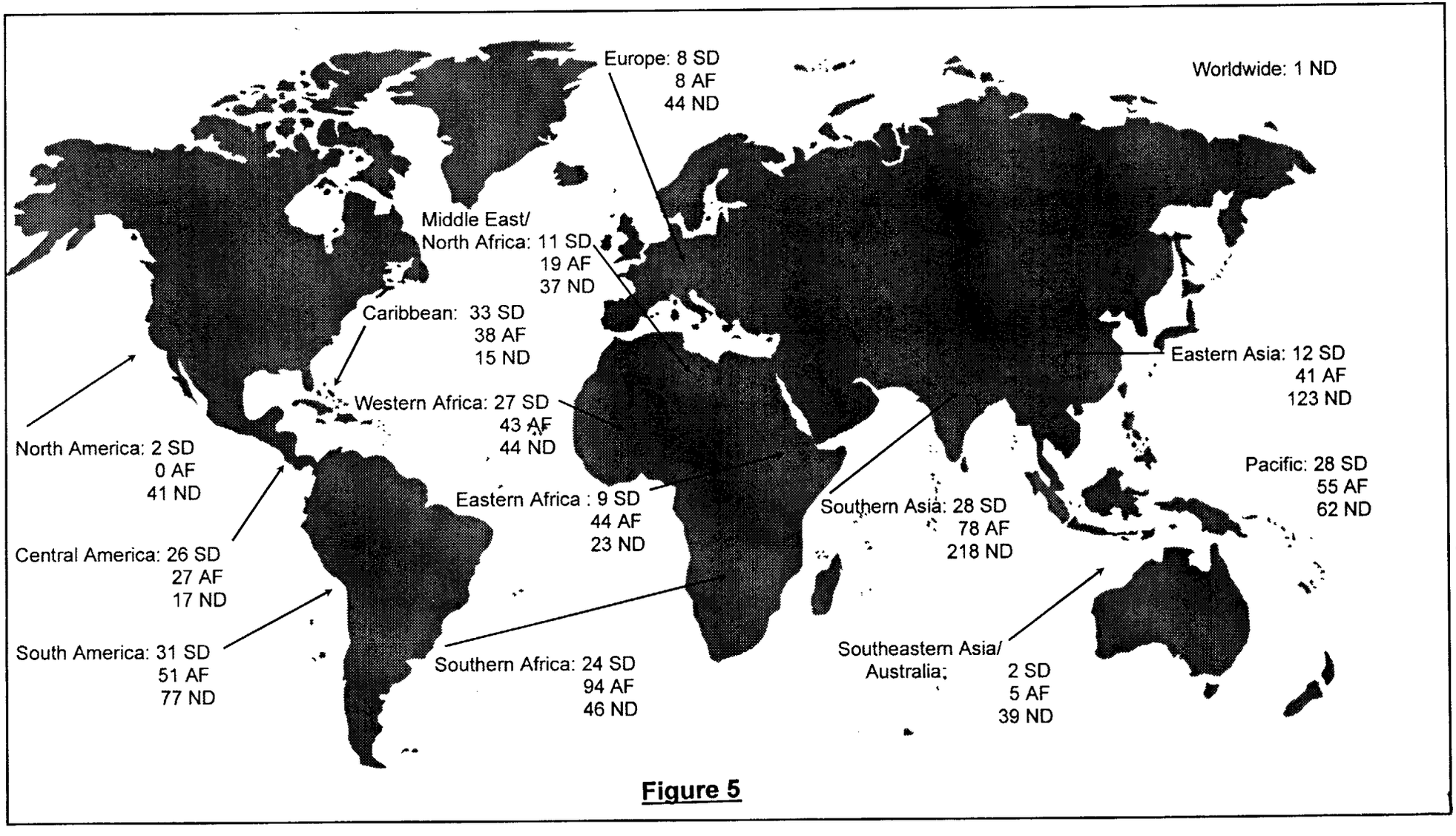


Figure 5