UNIVERSITY OF BRADFORD

DISASTER RESEARCH UNIT

Proposals for a Working Method of Indigenous Resource Coordination as Part of a Pre-Disaster Plan.

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PREFACE

The Disaster Research Unit was formed in December 1973 and is a research group within the Project Planning Centre for Developing Countries at the University of Bradford. Unit members are:

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This series of Occasional Papers will contain the results of the Unit's work. An Index of the Occasional Papers is included on the inside back cover.

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INTRODUCTION

This paper was first written in March 1973, some nine months before the formation of the Disaster Research Unit, under the title 'Planning for Disaster - A Working Method'. It is now being presented in this revised form to place it more precisely into the context of the programme of the Disaster Research Unit.

This programme sees pre-disaster planning as a comprehensive precautionary strategy ranging from administrative contingency planning, strengthening of buildings and revision of building codes, flood plain control and land use zoning to the technology or warning systems and psychology of response to them. These precautions will be prepared for a known vulnerability and analysed risk. Furthermore, the economic impact of natural disaster events can be explored (and their role in a condition of low development examined) in an assessment of losses from past disasters and a forecast of probable future losses. An ultimate comparison between the cost of recommended precautions and possible reductions in future losses after precautions have been taken should set the scene for work to commence as field assignments in specific locations.

It is only during recent years since 1970 that attention has begun to focus on pre-planning at all, but the major part of any interest in natural disaster is in relief. Much has been written about the alleged inefficiency of relief and the need for coordination and some steps have been made in this direction, but have served to concentrate still further on relief services.

The pre-planning of indigenous resources is seen as a first step for any disaster prone country to take towards comprehensive pre-planning and as a contribution towards providing relief resources of

its own immediately after a disaster event when need is greatest and before external relief has reached the scene. The value of the process will vary between different countries of different disaster vulnerability and development, but it is seen as the bridge between relief and pre-planning and once initiated pre-planning could go on to become the comprehensive strategy envisaged by the Unit.

If this first step is so significant therefore, the method of coordination and pre-planning in this aspect is all important. If new ground is being broken the way in which to go about the task is more important than a statement that it must be done and furthermore the method has to be explained simply and directly.

The purpose of this aspect of pre-planning is to enable a community or region to quickly assess what is likely to happen by way of disaster event or what has happened to what and to where, and to compare overall relief requirements with what is readily available.

If there is a philosophy of approach it is that the methods of the plan and the form of this study are intended to simulate the simplicity which is the essence of the idea. If, therefore, there appears to be the statement of the obvious, or the all too apparent, it is the submission of this study that that is in the nature of the exercise. As a working method it is directed towards administrators of less developed countries, having in mind that in operation it will be enacted under conditions of emotional and psychological strain, or in the least of great pressure of time. It is considered essential, therefore, that its simple terms are capable of being readily absorbed and quickly assimilated.

It is accepted from sources of considerable experience, that as a result of variations of type, location, time of impact, degree of

warning or nature of the smitten community for instance, each disaster will have a high content of the unique, but equally other experienced sources indicate that there is a degree of commonality between all disaster events albeit at a low level of judgement. It may be that a particular disaster will be unique in the experience of the majority of its victims and also to the authorities involved, or it may be that a particular disaster is one of an all too familiar series. In either case when seen from the point of view of the victim in the aftermath the needs of shelter, warmth, food and medicines will be common to any disaster occurrence even though the origin may be either for instance, earthquake (tectonic) or hurricane (atmospheric) and the immediate experience very different in each case.

There would appear to be advantages of operation if some degree of commonality can be achieved in such assessments and it may be worth an examination of statements to the contrary as kudos-seeking affiliation with the unique, in an attempt to establish a general basis from which, say, feedback of experience of disaster relief and feedback from application of the plan in disasters can be marshalled from a higher number of occurrences more quickly and be assimilated more readily, and be of use to more people. Familiarity with a plan will be increased by its relative simplicity and uniformity and its chances of successful application will therefore be increased. Individuals and organisations operating in different locations will have less opportunity for confusion caused by the application of different plans for different regions and for different types of disaster, especially where a severance of communications may remove opportunity for cross checking. Moreover, it has often been the case that a disaster of one kind has caused a disaster of another; earthquake to fire or hurricane to

flood. Extreme confusion might be the result if a switch of plan had to occur with each new development, or if more than one plan were in operation at one time.

Similarly, it is recommended that as much information as possible should be shown in graphic form using maps and symbols with the simplest legend. In demonstrating the plan, language barriers there may be will thus be more easily overcome and especially with the opportunity for the preparation of material in an attractive and easily understood and easily assimilated form (slides, film, etc.) the material itself may become a persuasive element where reluctance to embark on a pre-disaster plan exists. Opportunities for identifying with roles suggested in the administration of the plan will help to reveal the possibility of self-reliance and self-help systems in times of disaster by an awareness that when co-ordinated, the facilities for relief within an area may be considerable. Quarantelli (1973) has declared, albeit in a highly developed context, that community capacity for 'self-help' is much higher than usually receives acknowledgement. As preparation of the graphic plan proceeds, identification with strategic elements will in turn increase awareness of available recourses that will be on hand and gradually perhaps, the blank acceptance of natural occurrences (where this may be the case at present) causing disaster may be fortified and the effect of ensuing disasters mitigated as a result.

In a disaster-emergency time spent making reference to a bulky and lengthy document can be saved by a quick reference to a plan on the wall of an operations room to plot onto it the geographical extent and location and the effects of disaster, essential services rendered inoperative and the whereabouts and nature of those required to assist relief operations.

THE PLAN

The area chosen for a disaster plan will depend on the size of the country, its vulnerability to disaster and its topography, geography and administrative system. A large country may want to divide itself into co-ordinated regions, a smaller country may want to have one national plan. The division, if any, of a cohesive country will have a different basis to the division of a country formed of a group of islands. Account must also be taken of density of population, transportation and other networks of communication and allocation of resources strategic to disaster relief, but advice on this aspect will be on the principle of the fewer plans the better to simplify co-ordination.

Whatever the decision, when local action is involved, as it will be in most cases, at least two scales of plan formation will result - national and local; with the possibility of three - national, regional and local. As previously described it is the intention that this method of planning will apply to all regions whatever their size or vulnerability, precise operation of the plan and action taken depending on events but relying on preformed information routes and contingency planning. It has always to be remembered that natural forces are no respectors of man-made boundaries and regions must have plan forms to facilitate the co-ordination of inter-working as must neighbouring countries. A common disaster plan will be of paramount importance in achieving such co-operation.

The basis of the plan is to plot and compare on a topographical map of the region the strategic elements (ref. below) and areas vulnerable to disaster and the nature of anticipated disaster. (Where no topographical map exists it will be essential to produce one;

aerial photography providing the quickest method.) The strategic elements of the region may include some elements already on the map and these may be graphically emphasised by over-marking, preferably in colour (felt-tip pens). Others should be added symbolically and are likely to include all or some of the following:

Service establishments: army
airforce
navy
civil defence

Police stations and headquarters.

Fire fighting stations and headquarters.

Voluntary agency's headquarters.

Sea port and harbour facilities.

Airports.

Railway stations and depots

Public transport depots.

Commercial vehicle depots.

Construction plant (mobile cranes, bulldozers, excavators, trucks, etc.)

Construction material stocks.

Ambulance Stations.

Mobile cooking and food distribution centres (school meals, 'meals-on-wheels', etc.)

Utility Services supply stations and networks:
electricity
gas (town gas and bottled gas)
drinking water

Fuel depots (vehicle, heating, cooking).

TV stations, radio stations and mobile radio equipment.

Telephone exchanges.

Hospitals

Blood banks

Drugs warehouses and large stores

Food warehouses and large stores

Boundaries of administrative areas

Towns and villages: which by their allocation will give a ready indication of population density of an area.

Suitable sites for temporary housing and mobile hospitals, (parks, playing fields, markets, etc.)

'Permanent' buildings likely to be suitable as emergency shelters and feeding/first aid stations: schools, churches, colleges, cinemas etc.

Symbols will be used on the map to show these items and supporting information using the same symbols will be a dossier of key personnel with job description, home and office addresses and telephone numbers, and the alert system to be followed.

The dossier will also contain an alphabetical cross-referenced index of all possible headings for speed of reference to for example: aircraft, beds, blankets, boats, bottled gas, first-aid equipment, tents, 'walkie-talkies', water purification, and similar sub-headings to items not possible to be shown in graphic form. Under each section, as appropriate, will be information on quantities and types of equipment, manpower figures etc. An important aspect of the support information will be the whereabouts of available expertise if they are not already pooled within civil defence or voluntary agency organisations.

The definition of areas vulnerable to disaster will be based on history, precedent, statistics and geological and seismological research. Most types of disaster occur in areas noted for their occurrence, but regard must be given to geological aspects, as earthquakes and volcanoes (for instance) have been known to occur in locations with no previous recorded history of similar events. The advice of specialist research will enable data to be plotted with greater accuracy and must be sought wherever and whenever possible.

Natural disasters will be of any or all of the following:

Floods

Tornadoes

Hurricanes/Typhoons

Forest and Grass fires

Volcanoes

Earthquakes

Landslides

Tsunamis

Plague

Drought) being of slow onset allow a

Epidemic) greater degree of inherent warning.

Warning devices for these events and communication with them is another subject for research by the Unit, and will have a crucial bearing on the effectiveness of any plan of this kind. Each plan must include a method of communication with the adjacent region or country and with world networks such as the International Tsunami Warning System for the Pacific Ocean, the resident representative of the United Nations Development Programme, or the League of Red Cross Societies and the United Nations Disaster Relief Office in Geneva, for instance.

Transference of these warnings to the general public via communications networks of radio, television and loudspeaker units must be part of the disaster relief co-ordinator's function.

Some areas will be vulnerable to more than one kind of disaster and other areas will appear as being vulnerable to none at all. Some areas may be indicated as areas of special risk due to low quality high density housing or areas liable to landslip or subsidence in the event of tremor or heavy rains.

When information relating to the anticipated location of probable disaster forces is integrated in an analysis of the frequency and severity of disaster, some areas of vulnerability will assume additional emphasis. For instance, if hurricanes are likely to occur several times a year whilst tsunamis perhaps occur once every five years then the area shown liable to hurricane has a significant (and perhaps a priority) over areas shown vulnerable to tsunamis. These comparisons will be shown graphically on the maps using tonal or colour reference.

The total area subject to disaster vulnerability will be the sum of all areas susceptible to disaster events of one kind or another. Comparison of this entire area with the strategic elements of the region under consideration will reveal which elements are likely to be incapacitated by a disaster event, which will be likely to need assistance and which will be most likely available to contribute towards co-ordinated relief for stricken areas.

For each area where a graphic plan is prepared there must be a disaster administration to operate it which is aware of and prepared for all eventualities, and who will work with and be fully cognisant of the plan which is their 'modus operandi'. It will serve under a

co-ordinator/chairman who will have the authority for and be responsible for the operation and administration of the plan. Where there are a number of regions to be co-ordinated to form a national plan he will be responsible to a co-ordinator for the national plan through whom requests for relief aid outside the region will be passed. It is impractical to plan in terms of an administration of full time members waiting for a disaster to occur, but from amongst officials and experts who carry on regular job functions of a kind preferably relevant to disaster relief operations the co-ordinator will form a committee of representatives of preferably the principle strategic elements of the plan, e.g. army, civil defence, police, hospitals, telecommunications, public works, finance department, transport; most of whom will have special responsibilities within the plan e.g. rescue of sick and infirm from stricken hospitals, maintenance of communications systems and law and order.

The committee itself will have to be prepared for the event of disaster disrupting themselves or damaging their headquarters and must be further prepared for operating from an ad hoc control room with reduced members and severed communication links. The documents of the plan must obviously not be concentrated with one member or in one place.

Functions required to deal with most contingencies likely to occur are as follows:

Warning systems and communications

First aid and rescue

Medical care and nursing for sick and injured

Mass evacuation

Burial (human and animal)

Health and hygiene services

Repair of public utilities

Firefighting services

Law and order and security

Mass care (feeding and shelter)

Distribution of food and clothing

Tracing services

Declaration of missing and dead persons

These and other eventualities will serve as a check list against which the committee's preparedness may be monitored.

When disaster occurs the co-ordinator must determine and declare his headquarters to his region and national government and call upon the communications media at his disposal (as indicated on the plan) to supply him with information of the disaster area. He may want to use light aircraft, helicopters, jeeps, or bicycles to observe and report on the extent and nature of the occurrence; the nearest available transportation and whereabouts of crews/drivers being indicated by the plan and dossier. The disaster area must be plotted on an overlay of the map and be made subject to constant review as information about prevailing conditions comes in. Immediately, it will be seen which areas require assistance, what concentration of inhabitants there is and what danger from damaged utilities etc. Stockpiles and communications least affected will be similarly recognisable and strategic elements of the plan for relief must be contacted and combined, assembled, despatched and co-ordinated providing emergency services such as:

Air reconnaissance and survey

Mobile medical units

Mobile technical units

Mobile hospitals

Temporary hospitals

Demolition/clearing units

Security Guards

Temporary water supply/purification units

Public works units

Telephone linesmen

Co-ordination of press releases and other public information

in response to any or all of the eventualities previously listed. Some of these services may already exist in normal times but most will have to be formed and certainly contacted within the plan and deployed, e.g. mobile medical units and transport resources, ambulances and mobile hospitals. Emergency radio communications must be capable of linking the co-ordinator's office with the disaster area and with relief sources and as information comes into the co-ordinator's operations room by radio, telephone and messenger the extent of the occurrence and the adequacy of remaining resources to cope with the situation will be assessed. Communication must be established with internal government officials and co-ordinating agencies for world-wide relief organisations (League of Red Cross Societies and UNDRO) and information on the situation updated and conveyed regularly so that all necessary warnings can be promulgated and preparation made for appropriate relief when a request is received.

By the use of a plan of this kind a total picture of the effect of disaster in the region and a rapid assessment of resources will be possible. Decisions concerning assistance from outside the region

will be quicker and more precise, and a more accurate response to offers of assistance will be possible. In the event of outside assistance being required, new demands on the region's resources will be made and calls for distribution facilities will be met using similar methods. Similarly, intact towns and settlements outside the disaster area will be immediately recognisable and nominated as refugee centres with possible and available transport facilities between them and the disaster area recognised in the same way.

In the relief stages after disaster impact the plan will continue in use for the co-ordination and distribution of continued external aid and other assistance, food supplies, emergency housing, burial, sanitation and water supply.

Familiarisation of all members of the co-ordinator's committee and all key personnel from strategic elements of the plan with the pre-disaster plan should continue after the plan's formation and the training of personnel in disaster relief and emergency services likewise, having regard to feedback from other relief committees of experience from disasters they may have undergone. Vulnerability study, communications with warning systems and seismic/geological research and weather-watch services must be kept up to date and amended according to advances in research and technology.

APPENDIX 'A'

Plans of Natural Disaster Vulnerability and Strategic Elements: Mexico.

This part of the study is intended primarily as an illustration of the working method described and whilst it attempts to be as factual and as accurate as possible within the limits of information available, some aspects (areas liable to flood and most strategic elements) are entirely hypothetical and in any case only a representative sample of strategic elements have been included. (Since the first writing of this paper disaster events in Mexico have occurred essentially within the respective areas shown - hurricane in Yucatan, volcano in Central Mexico, earthquake on the east coast area, but it is now recognised that hurricanes also form on the Pacific Coast).

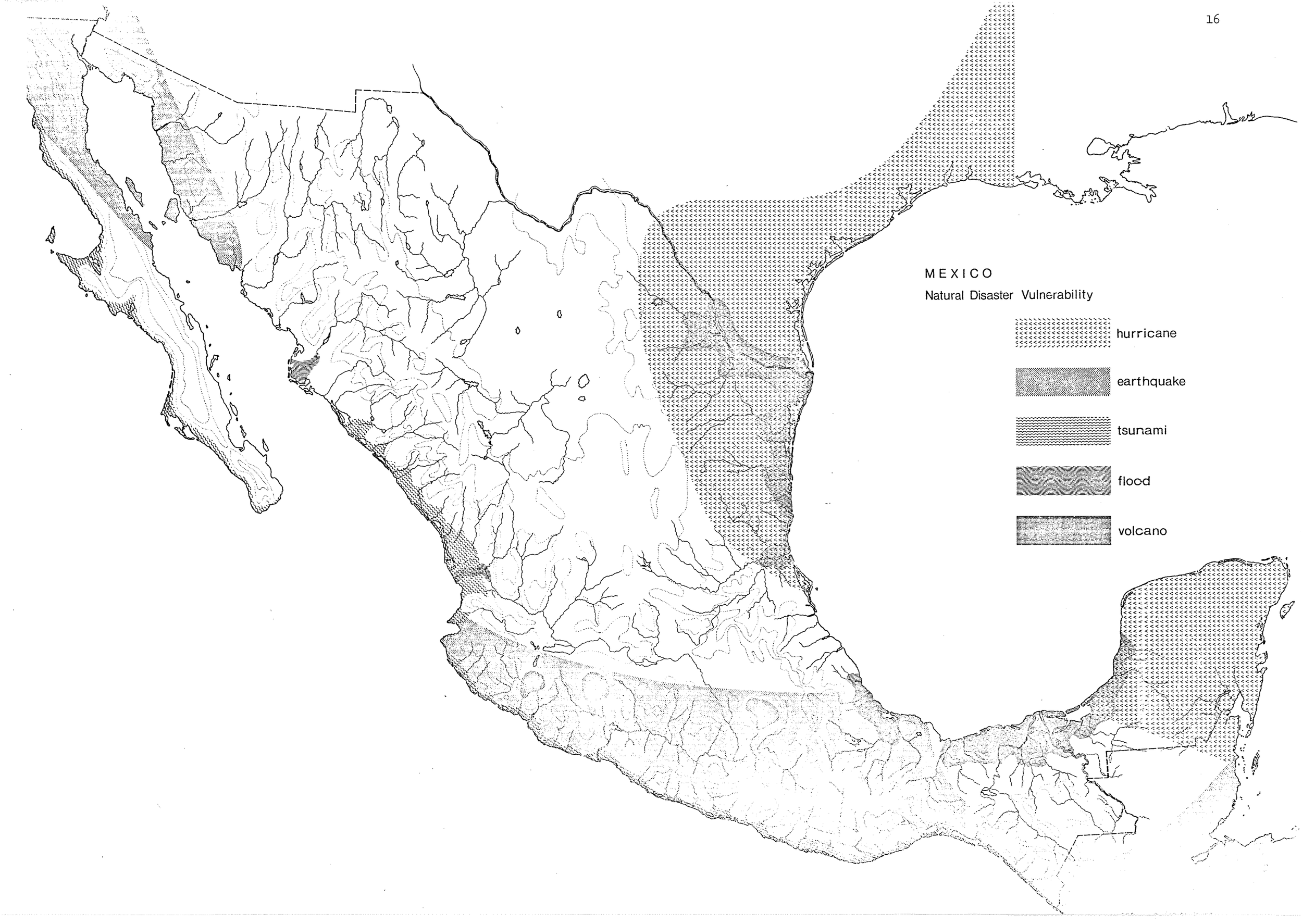
Mexico has been selected as a country of medium size and development with a record of natural disaster occurrence of some variety and extent. It has an area of some 760,000 square miles, a population of 51 million, over six thousand miles of coastline liable to flood, tsunami or hurricane and lies on an area of active seismic and volcanic activity.

This scale of plan is intended for a national plan and would serve for co-ordinating relief on a national scale in a major disaster. Larger scale plans of a smaller area might be prepared for groups of states, the boundaries of which are shown, and which would show in greater detail and density information for those areas (e.g. Mexico City). Regional maps to a larger scale would also show the degree of severity expected from disaster.

Due to the means of reproduction available to this study and

to the necessary small size, names of towns other than state capitals have been omitted. In reality the map would be to a larger size and scale, all names would be included on the base map and the use of colour giving greater clarity would be possible. Further, the use of existing maps (as would be possible in most cases) would simplify the preparation process.

Information has been divided between a base map and an overlay for the purpose of clarity. The advantages of producing the vulnerability map as a transparent overlay are apparent as seen in the first production of this paper. In the event the same technique will be used to 'overlay' a base map containing strategic elements with a map of a disaster area.


MEXICO
Natural Disaster Vulnerability
hurricane
earthquake
tsunami
flood
volcano

APPENDIX 'B'

A Programme for Preparation of the Plan

1.	Establish areas to be planned.	Appoint disaster relief co-ordinator
2.	Prepare and select a base map.	Establish vulnerability statistics, frequency and severity statistics.
3.	Prepare vulnerability map.	
4.	Prepare dossier in conjunction with authorities, companies, etc. List key personnel (addresses, telephone numbers).	Plot strategic elements on map
5.	Form disaster co-ordinator's committee.	
6.	Establish administrative plan: alternative bases, location of documents, communications.	Establish communication with adjacent regions/countries and world disaster relief agencies.
7.	Form links with world disaster warning systems and research stations.	Establish training programmes, feedback systems and machinery for updating plan.

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INDEX