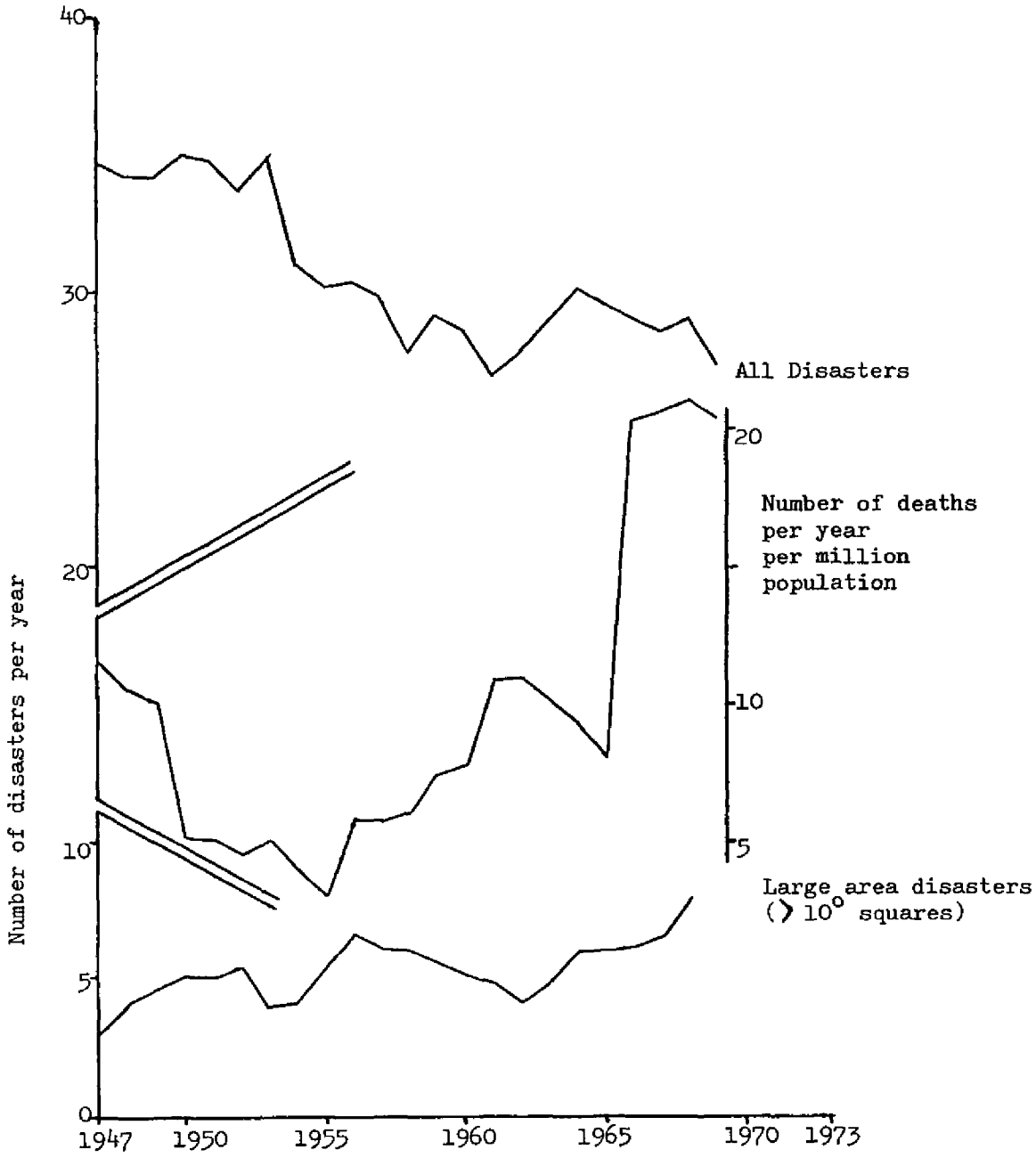
5. DISASTER TRENDS

Dworkin, in her analysis of data for the Natural Hazard Research Group attempted graphically to demonstrate those trends (Diagram 1). She observed that there appeared to be an increase in large-scale disasters and an increase in the number of deaths per year per million population but that there was an apparent decrease in the overall number of disasters. Remembering the particular bias of the Natural Hazard source material, this trend highlights a serious flow in the data. If overall disasters are decreasing and this conclusion is based, inter alia, on a criteria of at least $1,000,000 damage, it is nevertheless true to say that such a figure remaining constant over a period of 26 years takes no account of a decrease in value. $1,000,000 was a considerably greater amount of damage in 1947 than in 1973. One may conclude that as this real damage value is decreasing, so consequently disasters in 1973 based on the dollar damage criteria, will include those of a considerably less destructive nature than would appear in the 1947 figures. On this criteria many more disasters would be eligible for inclusion in the later figures than in the earlier ones. This criticism can be laid at the door of the Natural Hazard Research Group's admittedly biased source material because their conclusion that overall disasters are decreasing does not seem to be supported by recent data from elsewhere. The implications of the CRS data (Table 14) are that disasters are occurring very much as they were before rather than decreasing in total numbers. Table 14, which is very much a table of recent data on disaster, does not contradict the conclusion drawn by Dworkin in Diagram 1 that there is an increase in serious disaster situations.

These conclusions can be backed up by the UNDRO data. Table 24

DIAGRAM I

Global Disasters 1947-1973 : 5-Year Moving Average



(Dworkin, 1974)

Table 24

DISASTER AVERAGE BY TYPE PER ANNUM

Type	1968-71	1919-71	% Increase
Cyclone etc.	1.75	0.62	182.26
Drought	1.25	0.13	861.5
Earthquakes	2.0	1.3	53.8
Epidemics	0.5	0.19	163.6
Flood	6.75	2.7	150.0
Volcanic Eruptions	0.25	0.06	316.6
Famine	0.5	0.25	100.0

contains average disaster occurrences per annum for the periods 1919-71 and 1968-71 and both sets of means are derived from the same disaster population. In every case there is a substantial percentage increase in disaster occurrence, despite the probability of the physical event remaining constant. It is impossible to accurately assess the probability of the physical event being constant because of the dearth of material. Logically, however, one can assume that the probability is constant because there have been neither major geophysical nor major climatic movements that would induce a significant change in the probability of the physical event. This leads to a conclusion that despite the unreliability of the data, there does seem to be a general increase in disaster occurrence particularly when the probability of the physical event is considered.

Thus, five tendencies can be observed from the analysis of the data:

1. There appears to be an increased disaster occurrence over a four-year period as compared with a fifty-two year period.
2. There appears to be an increase in large-scale disasters although it cannot be seen that there is a tendency for an actual decrease in the number of disasters.
3. There appears to be an increase in every disaster type.
4. There appears to be a greater increase in the disaster phenomenon such as drought.
5. There appears to be an increasing vulnerability in underdeveloped regions and a greater loss of life per impact.

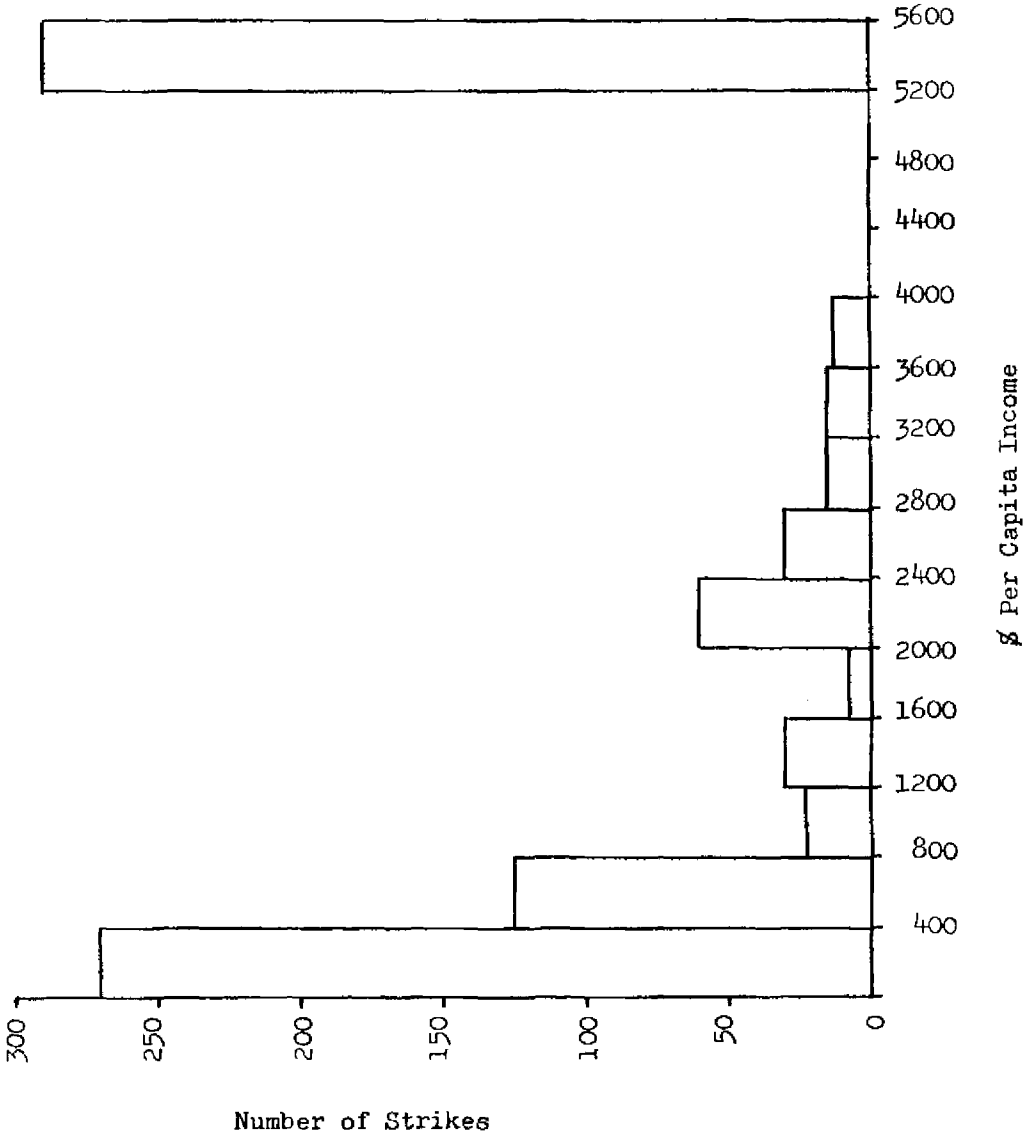
The foregoing discussion of disaster in terms of the defined roles of the organisations operating in disaster situations indicates that the organisations do not have a coherent view of the disaster process. Any definition of the disaster process must attempt to accommodate those trends

outlined in the data. It must include an assessment of the apparent increase of disaster occurrence, of every type of disaster with the greater increase in the long-term phenomena such as drought and famine, and the apparent increase in vulnerability in underdeveloped regions. The latter can be substantiated by graphing the number of disaster strikes from 1947-73 against the per capita income of the strike area (Diagram 2). Given the bias of the source material towards the USA (which accounts for the extraordinary number of strikes against a per capita income of $5,600 in Diagram 2) the diagram reveals that a significant proportion of strikes occur in areas where per capita income is less than $800. These trends are the key to the disaster process as it is occurring now. Before an attempt can be made to create the appropriate definition which caters for these trends, it is necessary to first assess the range of detailed academic research on disaster.

DIAGRAM 2

Number of Disaster Strikes by per capita Income of Disaster-Strike Area

(Data Source: Dworkin, 1974)



6. DISASTER - USE AND MISUSE OF AN EMOTIVE WORD

The term 'disaster' is often found to be in common misuse. It is used in many contexts but, although it is generally assumed that people know what is meant by 'disaster', precise meaning may often escape them. These questions of semantics may be unimportant in everyday parlance, but in the realm of disaster relief, research and planning, it is necessary to understand the exact connotation while not placing such a precision on any definition adopted as to render the situation rigid and imperious. A definition has its use in dispelling confusion and ambiguity while retaining a flexibility which is a necessity where so many intangibles are involved and where so many different physical characteristics impinge upon the situation. It is clear from the survey and analysis of the data institutions (see Sections 3 & 4) that the interpretations of the word 'disaster' are often dependent on the orientation of the organisation. In other words, the word 'disaster' can mean different things to different people. The problem is one of discretion.

'Disaster' is used by people in many walks of life - journalists, politicians, relief teams, academics, etc., and can be used to refer to the following factors:

1. The physical agent.
2. The physical consequences of the agent, i.e. damages and deaths.
3. The way in which the impact of the physical agent is evaluated.
4. Social disruption and social changes brought about by the physical agent and its impact. (Anderson, 1969).

Reference to the physical agent alone as disaster cannot justifiably be accepted. UNESCO, for example, produces data on the physical agent but is this a disaster? A hurricane far out over the Atlantic Ocean or an earthquake in an uninhabited mountain region cannot be called disasters per se. They remain physical phenomena all the time they are out of contact with the most significant factor in any disaster situation - people.

This is the major premise behind any discussion of the definitions of disaster. Disaster is about people, primarily a lot of people, their artefacts and appurtenances, their way-of-life and means of livelihood. Nevertheless, the disaster agent can be recognised as a necessary instigator of a particular effect on people, which can induce disaster. The characteristics of the physical agent in contact with a vulnerable group of people can be summarised as frequency of occurrence, physical consequences, speed of onset, length of possible forewarning, duration, scope of impact, destructive potential, gross predictability and gross controllability (McLuckie, 1970).

Given the fact that the physical event itself is not an adequate definition of disaster, it is obvious that the basis of any definition has to do with the interaction of more than one factor. The physical event itself is not disaster but the physical event is inextricably involved with disaster and disaster cannot be defined without the physical event. The interaction which is most likely to produce the appropriate collection of factors resulting in disaster is that between the physical agent and a collection of people.

It is necessary to impose some sort of limitation on the concept of disaster as it includes and is applied to collections of people. The

most likely limitation concerns numbers of people who would be assessed to be accessible to probable death, danger and destruction from a physical event. Michaelis suggests the following definitions:

> 'ACCIDENTS 1 - 1,000 people dead, or imminent danger of death.
>
> DISASTERS 1,000 - 1,000,000 people dead or imminent danger of death.
>
> CATASTROPHES More than 1,000,000 dead, or imminent danger of death'.
>
> (Michaelis, 1972)

Michaelis offers these as definitions but it would be facile to suggest that they are comprehensive. It can be assumed that were a physical agent to strike a desolate, virtually uninhabited area and one hill farmer was to die, this situation would not necessarily be referred to as a disaster. Yet where can the line be drawn? Of necessity this line is arbitrary. The important element in a disaster strike is to comprehend why so many people have died, so many are injured, so many are homeless, etc., without the hindrance of rigid definitions which would imply that because 999 people are dead or in imminent danger of death, a disaster is not declared. Disaster is the disruption of normalcy.

> 'It is an event (or series of events) which seriously disrupts normal activities'.
>
> (Cisin and Clark, 1962)

A long argument could ensue concerning what is or what is not normal. However, suffice it to say that disaster presents an individual by himself and individuals collectively with the occasion to behave and make decisions which are outside the scope of everyday life, <u>whilst at the same time being extensions of this everyday life</u>. This last point is important to emphasise as it is basic to the comprehension of disaster vis-a-vis the community. Disaster is properly applied to a collection of people

whose societal structure has maintained and perpetuated itself over a reasonably long period of time and in which these structures are easily recognisable (Barton, 1969). Thus, a situation of disaster exists when a structure is disrupted and then asked to extend its functions; societal structure does not suddenly cease to behave in the way in which it normally would and adopt behaviour which is alien to an everyday context. The apparent groups within the community's structure, somewhat interdependent in a normal situation, retain this interdependence in disaster and also tend to retain the rigid structure of priorities that may exist for each group. In fact, much of the structure and behaviour of normality is strongly emphasised in a disaster situation.

Form and Nosow, in a study of the effects of a tornado on the townships of Waco and San Angelo in the United States, discovered that, in general, people responded to the tornado by aiding others within the group structures to which they were attached and that their reactions were towards the most important groups in their lives first, graduating towards the less-important groups, for them, as they moved further away from the impact period. Generally, first responses by individuals were towards close family, followed by responses to relatives, close friends, neighbours and, finally, others. Individuals began with an orientation towards their own specific home environment and ended by adopting the role of rescue worker, similar to those who had come in from outside and had no previous contact with the area (Form and Nosow, 1958). This analysis reinforces the argument that community priorities are re-emphasized in disaster. Nevertheless, Form and Nosow claim the following definition of disaster as:

> '... a condition in which the established social life of a community or other type of social organisation abruptly ceases to operate'.
>
> (Form and Nosow, 1958)

The definition limits the time-space characteristics of disaster to that

period of strike or impact which may be measured in terms of seconds or hours. It is only during this short period of time that social organisation abruptly ceases to operate. Yet is this the period of disaster? Certainly it is the period when groups of people and a physical agent interact, the two factors essential for disaster. But the passage of the physical agent from the area does not imply that the state of disaster abruptly ceases. This period of impact is the state in which disaster is engineered. The resultant disruption can be considered as much a part of disaster as the impact itself because, although the actual period of interaction has passed, the effects of that interaction continue. The time period following impact displays the ability communities have for not remaining unoperational. The segments of society begin to operate again as an extension of the norm without the efficiency of the norm and certainly without many of the aspects which the norm would contain.

Thus, Form and Nosow understood disaster behaviour as occurring within the same sort of framework as customary behaviour, although in stating that social life ceases to operate, they neglect the nature of disaster as operating over a longer time period than merely that of impact. A community will tend to react rather in the way in which a person's heart may cease to function but on receiving requisite inputs of massage or resuscitation may begin to operate again quite quickly, if at first less efficiently than before.

Form and Nosow make statements on the conditions necessary for disaster to prevail. That is to say, they extend disaster to include a time period after impact.

> 'Disaster prevails wherever there is disfunction between the personal expectations for emergency behaviour and the community fulfilment of disaster services. This occurs when individuals do not fulfil their expected emergency roles, when emergency "organisations" fail to perform as

> expected, and when the expected emergency relationship between individuals and organisations are not reciprocally functioning'.
>
> (Form and Nosow, 1958)

Here, another aspect of disaster is introduced. To recapitulate, it has been stated that initially disasters emanate from interactions of physical elements and human communities. Furthermore, disaster does not apply merely to the period of impact but to that period of time when the results of that interaction are evident. Disaster does not imply the change from one societal structure to another, but rather an extension of the societal structure already in existence. Thus, Form and Nosow recognize that although the extension of pre-disaster community structure exists in disaster this very fact may lead to conflict between the functioning of the structure and the needs of the community which exacerbate the disaster situation. Anderson takes this one stage further by viewing the presence of actual threat as conducive to activity which <u>anticipates</u> disruption to everyday life. In other words the functioning community structure is assumed to be disrupted by the presence of threat.

> 'Conceptually it is convenient to distinguish disaster as an <u>event</u> of acute crisis which physically disrupts otherwise "normal" way of life and causes palpable loss from threat as a situation of chronic crisis which anticipates disruption in expected routine'.
>
> (Anderson, 1968)

Field research has observed that the community structure is extended in a disaster situation and that there is often conflict between the structure in action and what is expected of it. Anderson observes that it need not be actual disaster which assumes disruption but the threat of impending disaster as such leaves an indelible mark on the community which reveals itself in their everyday life. This idea in an ecological perspective, is the orientation of the Natural Hazard Research Group.

In this social context, Endleman attempts the following definition.

Disaster is

> '... an event, concentrated in time and space, in which a society, or a relatively self-sufficient subdivision of society undergoes severe danger and incurs such losses to its members and physical appurtenances that the social structure is disrupted and the fulfilment of all or some of the essential functions of the society is prevented'.
>
> (Endleman, 1952)

This, to a great extent, summarizes disaster in a social context. It emphasizes the key aspects, the key factors which make the interaction between physical event and human community the basis of disaster - disruption to essential services, losses both human and physical, the failure of the community structure to come up to the expectations of the people of that community. The community's expectations are not acceded to,not because the community structure itself is destroyed, but because the structure is unable to carry out the functions that underlie its existence.

How do these disruptive factors manifest themselves within the community? Beach lists ten such factors:

> '1. Sudden death or injury ...
> 2. Destruction of homes and other property ...
> 3. Destruction of the means of satisfying basic needs ...
> 4. The injury, death and disorganisation of emergency personnel ...
> 5. Destruction of roads and vehicles ...
> 6. Breakdown of the communication system ...
> 7. Threat and fear ...
> 8. Emotional shock ...
> 9. An extreme sense of urgency (by survivors) ...
> 10. The relative suddenness of disasters ...'
>
> (Beach, 1967)

Disaster may not manifest itself within a community in all these ways at a single time, but a situation of disaster is dependent on one or more

of these states existing within a community after the period of immediate impact.

Similarly, Dynes, Quarantelli and Kreps outline the demands that disaster makes upon a community given the manifestations of the disaster in the ways described by Beach above. These demands form the basis of the formation of alleviative measures and methods of planning to offset the effects of disaster. It can be assumed that disruptive factors will make their appearance within a community and that the demands emanating from these disruptive factors can give a temporal classification to disaster, namely:

1. Pre-disaster phase.
2. Warning phase - alert phase (early warning)
   - threat phase
3. Impact phase.
4. Emergency phase - isolation phase
   - assistance phase
5. Recovery phase.

(Beach, 1967)

Within these time characteristics the demands made upon a community can be assessed and inputs of each prepared and fed into the relevant time phase. These demands are divided into those which are generated by the agent of disaster and those generated by the expected response of the community to the disaster impact. Agent-generated demands are:

1. Warning
2. Pre-impact preparations
3. Search and rescue
4. Care of the injured and dead
5. Welfare demands

6. Restoration or essential community services
7. Protection against continuing threat
8. Community order

Response-generated demands are:

1. Communication
2. Continuing assessment of the emergency situation
3. Mobilization and utilization of human and materials resources
4. Co-ordination
5. Control and authority

(Dynes, Quarantelli and Kreps, 1972)

It is essential when examining the process of disaster, to see it in a total context. The social activity apparent in disaster situations is as much a part of the process as the initial causal interaction. The demands made by a community in a disaster situation are attempts to offset the disaster and to contain occurrence and effects within as short a period as possible.

It is possible to summarise the considerations about social response to disaster.

1. There is an interaction between a physical event and a community which results in the destruction or disruption of normal activity whilst normal social structures remain.
2. This interaction affects a community. That is to say, it affects a collection of people who occupy a common territory and are bound together in relatively permanent social relationships.
3. The interaction confronts a large section of the community with actual dangers or threats of danger and loss to

cherished values and material objects.

4. The interaction results in deaths, injuries, the destruction of property, and other losses and deprivations to the population: for example, the disruption of community utilities and other community services.

5. The direct and/or indirect consequences of the interaction affect a large proportion of the population within the community. That is to say, the repercussions of the interaction are diffused throughout the community rather than focused on a particular group or collection of individuals.

6. The interaction leaves the social structure in the same position as it was before impact but the functional status of that social structure may be faulty in the face of disruptive elements and may lead to a situation after impact which does not come up to the community's expectations and therefore demands change.

7. The interaction manifests itself after impact in a number of disruptive factors, combinations of which may affect the community to some degree.

8. The probability of combinations of disruptive factors affecting a community lead that community to make certain demands of itself by way of alleviation from the disruptive factors, these demands being placed within a time phase reflecting the course of events during which occurrence or the effects of interaction are actually taking place.

This is disaster as it affects a community with the emphasis on that community and its behaviour and response to the disaster before, during and after impact. It is summarised in the unitary theory of

disaster behaviour which states that disasters

> '... affect a relatively large number of persons; they are disruptive of normal behaviour, requiring sacrifice in the predisaster stages and rapid change in behaviour modes during and following the disaster itself; they frequently impose new norms and new ways of life as the price of survival; social structures and social controls are frequently destroyed and new means of control must be improvised; recuperation from disaster frequently involves a community in an unfamiliar dependency on other communities and on larger governmental structures'.
>
> (Cisin and Clark, 1962)

If it is the case that disasters result from the interaction of a physical event and a human community, does this interaction manifest itself in the form of a single event to be defined in a static way, or does the true nature of disaster definition lie in the potential interaction in the more dynamic interaction between man and his environment on a wider plane and over a longer time period? Even sociological research on disaster, whilst retaining its emphasis on the community during and after an actual disaster strike has bowed a knee to the potential for disaster occurrence rather than the actual.

> 'A narrow reading of disaster definitions may lead the unwary to conclude that only destructive events can be considered disastrous. The requirement that a disastrous event actually occurs would be unnecessarily restrictive in disaster research. But a potential disaster may be just as disruptive of individual and community behaviour as the actual event. The responses generated by hoaxes and false alarms clearly demonstrate that disaster behaviour can and does occur in the absence of objective danger. It is the perception of threat and not its actual existence that is important'.
>
> (Cisin and Clark, 1962)

Although retaining the link with a single event, this statement goes some way to the acceptance of potential disaster as a means of expressing the term dynamically, of expressing disaster as one small part within the whole spectrum of man/environment relations. In this respect it is

important to view the disastrous quality of the environment as a hazardous element of that environment, as an extreme event among a whole host of what would be termed more normal events. Disaster must be seen within the framework of man relating to his environment within a time span. The interaction is still there but it is a potential interaction, a hazard to be considered in the everyday association with the environment.

> 'A natural hazard of any sort is a function both of the physical event itself and the state of human society, including specifically the adjustments adopted to cope with the hazard and with the state of preparedness ... Hazards are largely implicit in the ordinary conditions, and it is important to define the latter, as well as the extremes'.
>
> (Hewitt and Burton, 1971)

It is in the nature of man to be in interaction with the environment because he is a resource user and the environment provides the resources. It is also in man's nature to select from the environment those elements of greater resource potential - flood plains, fault lines producing deep harbours, volcanic soils, etc. In choosing these more favourable situations man expects to develop a harmony with the environment which will result in an accumulation of wealth from the resource available. It is in the nature of the environment to carry with its more favourable elements, elements of hazardousness which could constrain the expected accumulation. Man attempts in various ways to negate the hazardousness of the environment by responding to it by means of adjustments to reduce the hazardousness. The response in the form of adjustment is a result of his perception of the hazard whether he has experienced an actual disaster situation associated with the hazard or not.

In discussing the hazard potential of the environment it is important to recognise this hazard as extreme. The hazard factor is that behaviour of the environment which shows several deviations from the mean.

It must be seen in the context of the day-to-day interaction of man with his environment - drought is merely too little water, flood is too much water: they are deviations from the optimum.

This is an attempt to define disaster in its ecological context. The foregoing sociological definitions of disaster heavily emphasize the extraordinary conditions that prevail during and after a specific disaster occurrence and they presuppose a level of technological development and a firmly-based and complex social structure to go some way to alleviating the disruptive and destructive effects of an impact. But does this static approach have relevance for all situations where man is in contact with the vagaries of his environment? It is strongly contended that to thoroughly comprehend the disaster process, a dynamic feature of the man/environment relationship, it is important to see disaster as the extreme situation which is implicit in the everyday condition of the population.

To explain this further, it is necessary to observe a range of disaster definitions from those having some involvement in disaster situations: journalistic, economic, sociological and relief definitions.

1. Journalistic. Michaelis' definition in terms of the number of people dead or in imminent danger of death has been discussed (see page 47 above). Walker's definition is much simpler:

> 'A disaster is an accident on a large scale'.
>
> (Walker, 1973)

Definitions such as this contain implicit references to the impact that the disaster may have in newsprint or via the visual media. It is a search for the devastation that will produce impact, the pictures of destruction, the heart-rending storyline to hold the reader or viewer in the interests of humanity.

2. Economic. The former United States Office of Emergency Preparedness offers the following definition:

> '"Disaster" means occurrence of imminent threat of widespread or severe damage, injury or loss of life or property resulting from any natural or manmade cause, including but not limited to fire, flood, earthquake, wind, storm, wave action, oil spill, or other water contamination requiring emergency action to avert danger or damage, volcanic activity, epidemic, air contamination, blight, drought, infestation, explosion, riot, or hostile military or paramilitary action'.
>
> (US Office of Emergency Preparedness, 1972)

Here, the underlying principles are those of economic origin. The emphasis is placed firstly on the damage a disaster event might cause and secondly on the resulting deaths and injuries that might result. Thus, this definition is concerned with the degree of disruption insofar as it counts as a loss to the economy.

3. Sociological definitions. These have already been discussed at great length and this definition of Killian's accepts the major points

> '... any disaster involves a disruption of the social context in which the individual functions. Deaths, injuries, destruction of property and disruption of communications all acquire importance principally as departures from the pattern of normal expectations upon which the individual builds up his actions from minute to minute'.
>
> (Killian, 1954)

This definition is chiefly concerned with societal structure, its disruption at disaster impact, and the behaviour of individuals and groups resulting from that disruption.

4. Relief. Krimgold attempts to define disaster for relief by referring to different levels of disaster and consequently different levels of relief.

> 'The real quality of disaster is that it presents problems within a context which cannot be solved

> with the resources found within that context. This means there are different levels of disaster. One may speak of local, regional, national, or even international disaster. A local disaster would be one which cannot be handled by strictly local resources and therefore require help from the regional level. A regional disaster would be one which would require help from the national level, and a national disaster would be one which would require help from other nations. This is the basis of a definition of disaster for relief purposes. What may be a national or international disaster in a small country with a fragile economy may not even constitute a local disaster in a rich country with well developed internal relief organisation'.
>
> (Krimgold, 1974)

Each one of these four definitions presupposes a physical event and a human community interacting but each of them is content to present the disaster occurrence - the static symbol of the disaster process - rather than the disaster process itself. These definitions do not envisage a continuing process of man/environment of which the specific disaster events about which they talk are but a manifestation.

It is clear that the same dilemma has arisen with the more academic research definitions as arose with the data-producing organisations. The definitions reflect the interest of the organisation, and contain no continuity - the sociologist emphasizes the social structure in a disaster event; the economist emphasizes economic loss during a disaster event; the journalist emphasizes the impact of a disaster event and the human condition emanating from it; the relief worker emphasizes the inputs of aid to a disaster event. None of them emphasizes the fact that disaster is a manifestation of the environment at an extreme level. None of them emphasizes the increase in the number of disasters of every type. None of them assesses the increase in disasters in the underdeveloped regions of the world. What is so significant to an understanding of the disaster process is the environmental context which surrounds each dis-

aster event - the state of things. If disasters are increasing generally, particularly in the underdeveloped regions of the world, then the underdeveloped world is absorbing much of the increase in disaster occurrence. Why is this so? What are the concomitant constituent parts of the environmental context that may impinge on this situation?

It is of paramount importance to recognise that much of disaster research is inapplicable to the underdeveloped world for two important reasons:

1. The majority of disaster research has had an intra-American domination and it therefore assumes or is heavily weighted towards a pro-Western, pro-technology, pro-capital context.

2. Following from the intra-American dominance, most of disaster research is naturally concerned with the developed context with all that this implies - a complex social organisation, a high level of manufacturing industry, a high level of available technology, the relative control of indigenous resources, the high level of alleviative measures such as insurance and the presumption of free choice.

Many of these developed world characteristics are not found in developing countries to the same degree, if at all. Necessarily then, definitions that have emanated from Western research and Western involvement may not offer a correct summation of what may exist in the developing countries. The limitations of many definitions have already been exposed. What is required is a set of workable definitions for the analysis of disaster which can be applied to locations <u>for which an understanding of disaster is most needed</u>. This will promote a better understanding of disaster and aid the tackling of problems emerging from the analysis of data on and trends in disaster occurrence.

7. DISASTER - PROPOSED WORKING DEFINITIONS

Two initial points must be stated:

1. It is essential, from the foregoing discussion, to view disaster as an extreme within a series of non-extreme events - an extension of everyday life where the latter is as important to an understanding of disaster as the disaster manifestation itself.

2. In all disaster situations, one word is operative. Societies and communities are always vulnerable. Disasters occur because a community is vulnerable to the vagaries of the environment.

Placing these two factors together, it can be asserted that disaster events occur at the interface between extreme physical and natural phenomena and a vulnerable human group. Disaster events are a manifestation of this interaction. This definition places disaster firmly in its ecological context by stressing extreme phenomena within the context of non-extreme phenomena which occur day-to-day. This interaction holds true for every manifestation of disaster throughout the world. Where it differs from disaster situation to disaster situation is between the relative ameliorative and recuperative qualities inherent in the situation in the developed context as compared with the underdeveloped context. The degree to which a vulnerable human group does not have the surplus to ameliorate the effects of an interaction with extreme physical or natural phenomena as distinct from a vulnerable human group with an adequate surplus capacity is a key factor operating within the disaster process.

Initially, it was proposed to assert that this surplus capacity, or

the comparative lack of it, be referred to as proneness. Proneness was to be seen as the ability to accept, absorb, reduce or change the vulnerability to disaster (Burton, Kates and White, forthcoming), and as being associated closely with vulnerability although distinct from it. The argument for the indentification of two distinct types of vulnerability - vulnerability and proneness - centred on the fact that two distinct components exist. Vulnerability, it was considered, implies that a given community is at risk from extreme phenomena where risk refers to the perjorative probability of the occurrence of a disaster event. Thus, in any given locality, certain sections of the community may be vulnerable, the degree of vulnerability being dependent on the degree of risk. But not every member of the community will be affected in the same way. Two individuals within the same community with equal vulnerability may not have the same capacity to absorb the effects of a disaster event - their proneness is not equal. Proneness was to refer to the degree to which socio-economic or socio-political factors affect the community's capacity to absorb and recover from the effects of a disaster event. Proneness was to aid the comprehension of the fact that socio-economic and socio-political factors may have as much a bearing on the cause of disaster as the physical or natural phenomena involved or the vulnerability of the community. Proneness was to be seen in terms of degrees. Extreme proneness, the complete lack of any surplus capacity to absorb the effects of disaster, can be witnessed in the underdeveloped world. This extreme proneness can be applied to the millions of people on the margins of society - the rural and urban poor. These marginalised peoples are the poorest of peoples. When a disaster event occurs they lose little because they have little to lose. But that little they do lose is probably all they have. Consequently, they lose all and because of this they stay lost, with no hope of immediate or near-future recovery. A succession of

disaster events exacerbates and hardens this position producing itself a continuing human disaster. This human disaster, of necessity, is not just promoted by the physical phenomena or the vulnerability of the location, but by the socio-economic or socio-political status of these marginalised peoples, as the lowest echelons of a hierarchical system which leaves them remote from accessible improvement.

Given that vulnerability implies a lack of protection against attack, it was felt that whereas the concept of proneness was useful and its constituent parts outlined above should be retained, in no sense could proneness be divorced from vulnerability and that the former could prove a misleading concept. To distinguish between vulnerability from the hazard environment and socio-economic status was considered to be a backward step because the two elements are inextricably one. Vulnerability to a hazard implies all that the concept of proneness attempted to define - vulnerability to a hazard includes the degree to which societies have the capacity to accept, absorb, reduce and change. Socio-economic status is often the key to a lack of protection against attack. Consequently, it is proposed that vulnerability should be a term which embraces not merely the risk from extreme phenomena but the endemic conditions inherent in a particular society which may exacerbate the risk. Vulnerability is an ecological concept.

The contention throughout this discussion has been that to comprehend fully disaster and the apparent increase in disaster events, especially in the underdeveloped countries, it is necessary to broaden the perspective of disaster. Vulnerability can explain this apparent increase. People who are very vulnerable to environmental vagaries tend to become more vulnerable to the next environmental extreme because of their lack of an adequate absorptive capacity and each successive environmental extreme will

leave the population more vulnerable to increasingly less severe disaster events. Thus, disaster proportions are being reached by the interaction of a vulnerable human group with physical phenomena which are becoming less and less extreme and consequently more and more frequent.

Concentration on the disaster event alone is myopic and does not give adequate enough insight into the part that these events play in the everyday lives of the population or the overall long-term effects. To observe, thus, a disaster event as but a manifestation of a continuing process which will include other such manifestations, is considered to be a more realistic way of approaching the overall disaster problem.

In conclusion, therefore, it is proposed that the following definitions be adopted as workable definitions which demand a genuine comprehension of disaster.

1. Disaster Event. The manifestation of an interaction between extreme physical or natural phenomena and a vulnerable human group. The manifestation results in general disruption and destruction, loss of life and livelihood and injury.

2. Disaster context. The sum total of the possibilities, probabilities and frequencies of the occurrence of various disaster events, including previous disaster histories, in any given location, which render the location vulnerable.

3. Disaster environment. The combination of the disaster context and the social, political and economic conditions prevailing within any given location.

4. Disaster process. The dynamic operation over time of the distinctive elements contained within the disaster environment and their inter-

relationship.

5. Vulnerability. The degree to which a community is at risk from the occurrence of extreme physical or natural phenomena where risk refers to the perjorative probability of occurrence, and the degree to which socio-economic and socio-political factors affect the community's capacity to absorb and recover from extreme phenomena. The term should be applied to the disaster context, the disaster environment and the disaster process.

6. Marginalisation. The most extreme manifestation of vulnerability occurring on the margins of society and properly applied to the urban and rural poor of the underdeveloped countries with little or no absorptive capacity in the face of extreme phenomena.

These definitions cannot stand in isolation. They are properly applied to the application of research in actual situations where human groups are vulnerable to extreme natural phenomena. This practical activity which attempts to instigate strategies of amelioration and mitigation can be referred to as predisaster planning. Predisaster planning is a policy implementation over time which sets its objectives in the form of targets for mitigating the effects of disaster by a comprehensive co-ordination of indigenous resources and infrastructure. Predisaster planning does not imply that the planning activity occurs before the next disaster event and then abruptly ceases. It implies that predisaster planning, to be successful, should begin in the time period between two events and continue as an ongoing process.

BIBLIOGRAPHY

ANDERSON, J.W. (1968) 'Cultural Adaptation to Threatened Disaster'. Human Organisation, Vol. 27, No. 4,pp. 298-307.

ANDERSON, W.A. (1969) Local Civil Defense in Natural Disaster: From Office to Organisation. Disaster Research Center Report Series No. 7, Ohio State University Columbus.

BARTON, A.H. (1969) Communities in Disaster: A Sociological Analysis of Collective Stress Situations. Doubleday & Co., New York.

BEACH, H.D. (1967) Management of Human Behaviour in Disaster. Canadian Department of National Health and Welfare, Emergency Health Services Division.

BURTON, I; KATES, R.W.; WHITE, G.F. (Forthcoming) The Environment as Hazard. Oxford University Press.

CATHOLIC RELIEF SERVICES (1974) Narrowing the Gap. New York.

CISIN, I.H.; CLARK W.B. (1962). 'The Methodological Challenge of Disaster Research', in G.W. Baker and D.W. Chapman (eds.): Man and Society in Disaster. Basic Books, New York.

DWORKIN, J. (1974) Global Trends in Natural Disasters 1947-73. Natural Hazard Research Working Paper No. 26, University of Colorado, Department of Behavioural Science, Boulder.

DYNES, R.R.; QUARANTELLI, E.L.; KREPS, G. (1972). A Perspective on Disaster Planning. Disaster Research Center, Report Series No. 11, Ohio State University, Columbus.

ENDLEMAN, R. (1952) An Approach to the Study of Disasters. Disaster Research Project, National Opinion Research Center, Chicago.

FORM, W.H.; NOSOW, S. (1958) Community in Disaster. Harper and Bros. New York.

HEWITT, K.; BURTON, I. (1971) The Hazardousness of a Place: A Regional Ecology of Damaging Events. University of Toronto Press, Toronto.

KATES, R.W. (Forthcoming) Disasters and Development.

KILLIAN, L.M. (1954) 'Some Accomplishments and Some Needs in Disaster Study'. Journal of Social Issues, Vol. 10, No. 3, pp. 66-72.

KRIMGOLD, F. (1974) Pre-disaster Planning: the Role of International Aid for Pre-disaster Planning in Developing Countries. Avdelningen för Arkitektur, Kth Stockholm Skrift.

McLUCKIE, B.F. (1970) The Warning System in Disaster Situations: A Selective Analysis. Disaster Research Center, Report Series No. 9, Ohio State University, Columbus.

MICHAELIS, A.R. (1972) 'Disasters Past and Future'. The Daily Telegraph, London.

RORHOLT, A. (1974) Reflections on Red Cross and Disaster Relief. League of Red Cross Societies, Geneva.

SHEEHAN, L.; HEWITT, K. (1969) A Pilot Study of Global Natural Disasters of the Past Twenty Years. Natural Hazard Research Working Paper No. 11, University of Colorado, Department of Behavioural Science, Boulder.

SMITHSONIAN INSTITUTION, CENTER FOR SHORT-LIVED PHENOMENA (1971) Annual Report 1970. Cambridge, Mass.

SMITHSONIAN INSTITUTION, CENTER FOR SHORT-LIVED PHENOMENA (1972) Annual Report 1971. Office of Environmental Sciences, Washington D.C.

STANISSIS, P.C. (1972) Disaster Analysis. United Nations Disaster Relief Office, Geneva.

UNDRO (1973) Note on UNDRO and Disaster Relief Activities. UNDRO Conference Room Paper No. 2, Geneva.

UNITED NATIONS ECONOMIC AND SOCIAL COUNCIL (1971) Assistance in Cases of Natural Disaster: Comprehensive Report of the Secretary-General. 51st Session, Agenda Item 15, Document E/4994, New York.

UNESCO (1970) Annual Summary of Information on Natural Disasters, 1966. Paris.

UNESCO (1971) Annual Summary of Information on Natural Disasters, 1969. Paris.

USAID (1964) Foreign Disaster Emergency Relief, Introduction and Definitions. Washington D.C.

USAID (1973) Foreign Disaster Emergency Relief: 11th Report, 1972. Washington D.C.

USAID (1974) Disaster File Computer Printout. Washington D.C.

US OFFICE OF EMERGENCY PREPAREDNESS (1972) Disaster Preparedness: Report to Congress. Washington D.C.

WALKER, J. (1973) Disaster. Studio Vista, London.

WORLD COUNCIL OF CHURCHES (1973) Questions and Answers about the World Council of Churches. Geneva.

INDEX