

Preventive Planning for Disasters

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The authors have analysed the available data on disaster occurrence and conclude that disasters are on the increase, especially in underdeveloped countries. They argue that a new approach to disaster is needed, one which emphasizes the continuing man-environment relationship. Within this approach, planning to prevent disaster should concentrate on long-term precautionary planning integrated into development planning utilizing, as far as possible, local awareness of the disaster problem. This long-term approach to disaster planning is a more effective way of offsetting disaster than a heavy emphasis on each individual disaster event and the relief measures which accompany it.

To adequately formulate a plan for any activity, it is necessary to understand the processes involved in that activity. This article will indicate that disaster occurrence is greatly misunderstood and consequently disaster plans are often ill-conceived. The misconceptions contained within disaster planning formulation and implementation can and do lead to an increase in vulnerability to natural hazard. The article attempts to provide a sound basis for disaster planning by locating disaster planning within a framework of development planning because the authors regard socio-economic vulnerability as the basic cause of disaster and argue that this vulnerability will only decrease if disaster planning is seen as part and parcel of development planning.

The Nature of Disaster

The media continually presents us with graphic accounts of natural disasters—the Bangladesh cyclone, the Nicaraguan earthquake and the African drought are recent examples of catastrophes that caused much death and destruction. Since the beginning of 1976, we have already had detailed accounts of floods in Venezuela, Australia and Indonesia, famine in Niger, landslides in Ecuador, drought in Malaysia and large earthquakes in Guatemala, Italy, China and the Philippines. It is difficult to gather global information on the frequency and, more importantly, the impact of these disasters but the Disaster Research Unit at the University of Bradford has recently compiled a set of global statistics from all available sources (Baird *et al.*, 1975).

Data was collected from international organizations, government departments, academic institutions and insurance companies. The data was confused because most institutions recording disaster data had an implicit role in a disaster situation which coloured their data recording (Westgate and O'Keefe, 1976). For example, the international and governmental organizations were chiefly concerned with disaster situations in which aid was donated; academic institutions were primarily interested in recording unusual phenomena which might not necessarily be disastrous or with the interpretation of disaster according to some arbitrary criterion of deaths and losses; insurance companies only recorded information directly related to their business. Despite the unreliability of the data, however, several tendencies can be observed.

The most important tendency is an increase in disaster occurrence over the last 50 years. Figure 1 shows this increase from 1947–1970 of large-scale disasters, i.e. those disasters covering more than a 10° square on a world map and where damage exceeds \$1m (Dworkin, 1974).

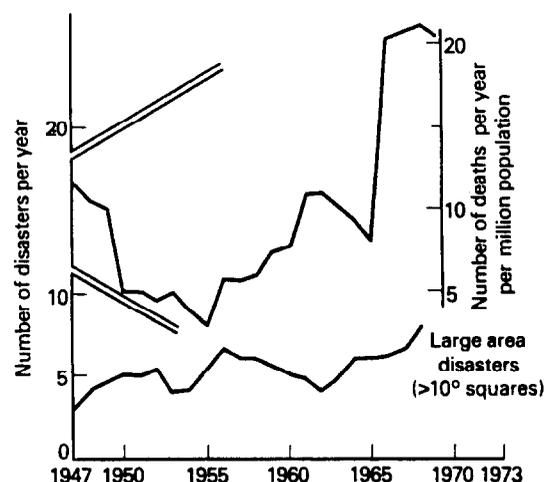


Figure 1. Global disasters 1947–1970: 5-year moving average.

This tendency towards increasing disasters is paralleled by an increasing loss of life per disaster event. The greatest loss of life per disaster impact is observed in underdeveloped countries and there are general indications that the vulnerability of underdeveloped countries is

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increasing (Hussein, 1976). Such conclusions clearly require further explanation.

Disaster is defined as the interface between an extreme physical phenomenon and a vulnerable human population. It is of paramount importance to realize that there are these two elements in a disaster situation, namely, the extreme physical event *and* the vulnerable population; *without people, there is no disaster*. These two elements are basic to an explanation of an increase in disaster occurrence. Over the last 50 years, there have been no major geological or climatological changes that would adequately explain the rise in disaster occurrence. There is little argument about geological change and much mystifying argument about climatic change. Although in recent years arguments have ranged fiercely about climatic change following the prolonged drought over the African and Asian continents, no firm conclusion can be drawn about changing climatic conditions from available evidence. Randall Baker at the Development Studies School of the University of East Anglia has recently reviewed all the evidence of climatic change in Africa and offers the Scottish judgment of 'case not proven' (Baker, 1977). Even if some long-term change was observable it would not explain the increase in disaster occurrence observed in the data. If it is accepted that there has been no major geological and climatological change in recent years, then it can be assumed that the probability of the extreme physical occurrence is constant. If the probability is constant, then logically the explanation of disaster increase lies in the growing vulnerability of the population to extreme physical events.

Ongoing research suggests that a radical rethink on the nature of 'natural' disasters is necessary. It is known that the frequency of natural disasters is increasing especially in underdeveloped countries. The explanation of this phenomenon is the increased vulnerability of people to these extreme physical events, an increased vulnerability which is seen to be intimately connected with the continuing process of underdevelopment recorded throughout the world (O'Keefe and Wisner, 1976). As population continues to expand, as resources continue to be controlled by a minority, the real standard of living drops for much of the world's population. This population is increasingly vulnerable to environmental variation as the process of underdevelopment continues. Paul Richards of the Environmental Unit in the International African Institute has recently emphasized this argument when he wrote in his introduction to *African Environment: Problems and Perspectives* that,

Perhaps the most thought-provoking idea of all is that just as natural processes such as lack of rainfall affect social structures, so social processes such as economic 'development' can affect natural systems, 'causing' famine and soil erosion for example. This notion . . . should make us think again about the term natural disaster. For in a continent where international ties of dependency, massive international labour migration and multinational companies prevail and in a world where growth does not necessarily mean development, and development does not necessarily bring enrichment or an increase in personal happiness, the ultimate cause of environmental problems may well be traceable to

the structural imbalances between rich and poor countries and we would be right to replace the term *natural* with the more appropriate term *social* or *political* disaster.

(Richards, 1975)

These suggestions would strike the Guatemalan peasant as commonsense. The recent earthquake is no longer identified as a natural event—the local inhabitants who survived are referring to the event as a 'classquake'.

Marginalization

The process of increasing vulnerability because of deteriorating socio-economic conditions is one which has been identified as marginalization. The concept of marginality was initially used to denote the relative deprivation of populations, particularly migrant populations on peri-urban areas because these populations were not integrated into development. It was assumed that if this population were sufficiently organized to adjust and adapt to society then the problem of deprivation would simply disappear. This interpretation accepts socio-economic development as a linear process along which societies move from a state of underdevelopment to a state of development assimilating similar structures and values as developed western society. Radically opposed to this interpretation of marginality and development, which does not fit the history of the real world, was a view of marginality which stressed that the population identified as marginal was assumed to be not integrated into society but was, in fact, fully integrated into society. Marginal populations are marginal, not because of their own behaviour, but because of the outcome of complex relationships with other class and interest groups of society. This view maintains that development along western lines can only occur and maintain itself if development is centralized; the consequences of the processes of the accumulation of wealth and the concentration of power is the underdevelopment of the peripheral areas. The process of marginalization can only be understood in terms of the continued exploitation of the periphery. It is this process Guatemalan peasants identify when they talk of a 'classquake' (Worsley, 1976).

The reality of this situation is shown in Figure 2.

The poorest countries are those that suffer most disaster strikes. The large number of disasters recorded in developed countries is a reflection of the closer monitoring of disaster events. The general tendency that most disaster strikes are occurring in underdeveloped countries indicates that further research must be done on the process of marginalization delimiting economic, socio-political and eco-demographic marginality (Wisner *et al.*, 1976).

Such a viewpoint on disasters should encourage precautionary planning to mitigate the effect of future disaster. The concentration of such planning should be on the vulnerability of a population to future disaster, a concentration on vulnerability that can only be analysed

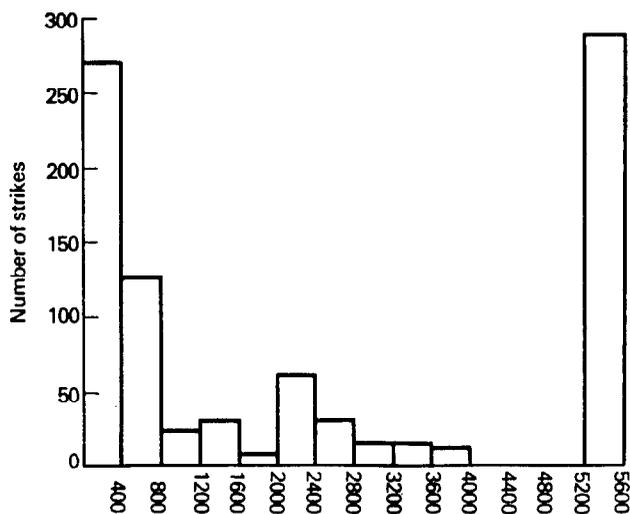


Figure 2. Number of disaster strikes by *per capita* income of disaster strike area.

through an understanding of the process of marginalization. This emphasis on precautionary planning does not obliterate the necessary valuable action in a post-disaster scenario. In fact, the formation of the London Technical Group which supplies accurate technical reports on immediate post-disaster situations and generally provides expertise on relief measures is to be warmly welcomed. In the long run, however, precautionary planning will be more beneficial than relief work; it is important to consider and alleviate the causes and not merely the symptoms of disaster. The design of a successful precautionary plan can only be achieved if the orientation of the plan is focused on the population's vulnerability. Successful precautionary planning depends upon the identification of cultural attitudes towards the use of indigenous resources at local and regional levels and the incorporation of disaster mitigation strategies into development planning; in fact, precautionary planning should be seen as the insurance chapter on any development plan delimiting the boundaries within which development can occur.

The average cost of a disaster strike, a rather meaningless concept when the range of impact is so great, is about \$20m. It is sufficient to say that more than \$1133.9m was spent on disaster assistance in 1973; 96 countries of the world had less than this amount of resource capital as GNP in 1973. The time is ripe for some form of precautionary planning which considers vulnerability of the population as the real cause of disaster, a vulnerability that is induced by socio-economic conditions that can be modified by man, is not just an 'Act of God'. Precautionary planning must commence by the removal of the concepts of naturalness from natural disasters (O'Keefe *et al.*, 1976).

The Problems of Planning

Before assessing the necessary requirements for a successful approach to precautionary planning for disaster it is necessary to briefly discuss some of the problems encountered by development planning in under-

developed countries. The reason for this is not merely that disaster planning is closely associated with development planning but that it is an integral part of the latter if only because both planning approaches should have as their aim the decrease of socio-economic vulnerability.

Planning is a relatively recent development in its wholesale application to national economies. As large areas of the world gained their independence, 'development' became an important priority. The early attempts by the U.S.S.R. revealed the viability of the planned economy and since 1952, when India introduced its first 5-year plan, virtually every underdeveloped country has seen fit to adopt planning techniques as the best method of securing development. However, a growing cynicism has emerged regarding the efficacy of planning as it is seen that although plan has succeeded plan in rapid succession, none of them have been implemented to any effect. The reasons for this cynicism do not necessarily lie in the plan itself or in the commitment to planning but rather in the attitudes prevailing in a country which supersede and often eliminate the intentions of the plan. Three reasons emerge:

- (1) The plan is normally prepared by experts from developed countries with no indigenous roots.
- (2) Planners have, in the main, been economists who thus tend to produce documents whose contents are narrow-minded and take little account of the social or political conditions that prevail.
- (3) In assessing the economic context, planners are applying themselves, in the main, to an economic system which emanates from the developed world which answers the questions posed by the ruling elite in an underdeveloped country who tend to retain the vestiges of previous colonial rule. The questions posed by the mass of the rural population tend not to be answered by reference to such an economic and value system because their approach to resources and environment are likely to be very different even though they are seen as part of the political and economic system operated by the ruling elites of these underdeveloped countries.

Planners must not underestimate the capacity of any society to meet problems and to successfully cope with them and this is particularly so with reference to underdeveloped countries. The indigenous capacity to solve problems is immediately violated when planners are brought in from outside without a knowledge of the economic, social and political framework with which their work will have to take effect.

It is important to recognize that development planning implies the purposeful direction of human activities. Underdeveloped countries may be said to have generalized characteristics which set them apart from the developed world. Yet the latter, through former colonial linkages, tends to operate in the underdeveloped countries in a way which assumes the predominance of the developed framework. This leads to planning practices which may be alien to indigenous needs.

Development planning in underdeveloped countries is essentially the promotion of political power. However, in order to be of maximum use, the political sector should attempt to have as its objectives practical and tangible concepts and goals which are seen to have value by the indigenous population. Nebulous concepts such as 'growths' have little meaning to a rural subsistence population whereas a project aiming at increasing output based on the constraints within which that population operates would probably have significant meaning.

Development planning has tended to utilize models developed for the more sophisticated societies of the western world. In poor, dependent, monocultural, underdeveloped societies, many of these concepts have little meaning. Planning should concentrate on what is appropriate to a particular country in terms of its coming to an understanding of its own environment. Many models gained from the West are inappropriate to meaningful development.

The Necessary Principles for Effective Disaster Planning

Major disasters kill many people and leave thousands homeless every year. The immediate requirements of a disaster-stricken population are obvious—they require food, shelter and clothing. Requests from the stricken country for these requirements are taken up by international organizations and governments who generally supply the items required. Consequently, the suffering of the people can be relieved. Is it correct to assume, however, that, by channelling available resources into relief after disaster, the disaster problem has been solved for that population? Does this relief affect their vulnerability to future disaster occurrence?

Shelter and food are two basic requirements of a disaster-stricken population. Calls for shelter are answered by the provision of tents or pseudo-tents. It is usual to find that these temporary housing measures become permanent; tented villages still exist some months, or even years, after the disaster has occurred (Davis, 1975). Similarly, massive supplies of relief food discourage local farmers from cultivating land and encourage dependency on external food supplies. Such distortions of the existing socio-economic conditions can obviously increase the vulnerability of a population to further disaster.

To avoid increasing vulnerability, disaster relief policy must be re-orientated towards *the mitigation of future disaster occurrence* to give developing countries a greater *self-reliance* in coping with disaster. This is not to say that immediate relief requirements are not vital. What is required is an understanding that as well as catering for the immediate needs of a disaster-stricken population government should consider the need for a continuing programme of disaster mitigation measures to be integrated into development plans, which will tend not only to decrease the population's vulnerability to

disaster occurrence, but also act as *an insurance of the development plans themselves*. Disasters interrupt development programmes to a great degree and appropriate mitigative measures can decrease the possible losses.

An Approach to Disaster Mitigation

Any disaster mitigation policy for developing countries must have at its core the promotion of *self-reliance as far as possible*. Such a policy should bear in mind four vital points:

- (1) Disasters are not just isolated events but are recurring phenomena; for example, Managua was damaged by earthquakes in 1885, 1931, 1968 and 1972. An earthquake can therefore be expected at some time in the future. This fact tends to be reflected in the lives of the population to a greater or lesser degree, depending on the frequency of occurrence. The population, consciously or unconsciously, respond in their everyday lives by action or attitude, to the future earthquake threat. Disaster is, thus, a continuing process. *Just as this fact is often reflected in local attitudes, so equally it should be reflected in disaster aid.*
- (2) Efforts at the provision of adequate defences against disaster should concentrate on the promotion of self-reliance. This implies the utilization of local resources and technologies. Selective foreign technology, methods and ideas should only be utilized where they are appropriate to the culture and resource utilization of the local population.
- (3) In developing countries it is essential that attempts at disaster mitigation be incorporated into development planning as an insurance of development. It has already been stated that disaster should be seen as a continuing process. Development planning is also a continuing process and disaster mitigation strategies quite properly should find their place within this development strategy and not be considered as an isolated exercise.
- (4) Vulnerability is not a static concept. Populations have different levels of vulnerability depending upon their biophysical conditions and socio-economic status. Evidence shows that the locations of prime importance for sustained mitigative activity should be those areas where the populations' vulnerability to disaster is greatest because its socio-economic status is low. *This concentration on socio-economic status is a more important consideration than the intensity of the disaster agent.* Disaster must always be seen against a backdrop of normal everyday activity. Conditions of risk can only be understood by examining the economic ecology of resource management within any vulnerable situation.

These four points should act as guidelines for a successful disaster mitigation strategy. The following examples give an indication of some elements of this strategy.

- (a) The survey and analysis of local adjustments to the particular hazard or hazards involved. *Adjustment* refers to the response made by an individual or community in the face of potential disaster which

aims to counteract the occurrence of actual disaster; for example, the movement of cattle from low land to higher land in anticipation of an annual spring flood. *These local adjustment processes should be encouraged wherever possible and only mixed with foreign methods or technologies where the latter can aid in securing the appropriate strategies for that particular population (Wisner et al., 1977).*

- (b) A survey and analysis of local attitudes to potential disaster. These attitudes, such as fear, resignation, etc. can have a great bearing on information and education programmes. Ignorance of these attitudes can lead to wrong decisions being taken and harmful strategies being adopted (Westgate, 1975).
- (c) A survey and analysis of the effect of potential disaster on local economies. In most cases, the industrial sectors of the economy will have some degree of protection even in developing countries. It is essential that attention be focused on the damage potential to the rural population who, in the majority of developing countries are the largest single sector of the population and whose economic contribution is often the largest single factor in national production. With an orientation towards this rural population, not only will overall vulnerability to disaster decrease, but real development will be stimulated (O'Keefe, 1975).

These examples show some areas where aid can contribute to successful disaster mitigation instead of a short-term relief programme which treats the immediate symptoms and not the causes of true disaster and only temporarily alleviates the situation. The immediate requirements of a stricken population in the first instance, can be adequately accommodated by self-help, which is usually underestimated, and by voluntary agencies whose appeal for public support requires immediate and visible results. Government aid should orientate itself to the identification of disaster potential and the mitigation of future disaster occurrence by the promotion of appropriate measures. In all cases, a successful disaster mitigation programme must result in *self-reliance* wherever possible, within a *comprehension*

of local cultural attitudes and traits, must be seen as a part of development planning and not as an isolated and separate process, and must consider 'disaster' as an ongoing phenomenon and not as a series of isolated events.

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