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The work of the Disaster Research Unit at the University of Bradford is an interesting example of risk management techniques being applied to national economics. It emphasises, in particular, that a multi-disciplinary approach can often provide a method of linking the work of a number of specialisations which have tended to remain separate.

Here JAMES LEWIS, the leader of the Unit, who is an architect by training, describes of the Unit's activities and aims.

'PRECAUTIONARY PLANNING FOR NATURAL DISASTER'

by James Lewis

Taken in a world context, most attention to natural disaster has been scientific in origin and has been based on an analysis of the phenomenon itself said to be the cause of the disaster - by seismologists examining earthquake occurrence for instance, or by meteorologists examining the formation of hurricanes, or vulcanologists studying volcanic eruption. Some major works and important papers advancing knowledge in each topic have been produced as a result, and maps and atlases have contained information on the likely occurrence of each of these events.

This scientific and analytical approach has contributed to a tendency to consider and report on disaster events as single occurrences, each one another statistical event to add to the numbers of occurrences already tabulated and each one to be considered by the press as a candidate for banner headlines, only to be forgotten within a few days. With this background it is of little surprise that what little attention there has been to preparedness for disaster has been on an ad hoc basis and pragmatic in operation, and has had as its end product a document - a plan - forgotten (like the banner headline) as soon as it has been completed. Indeed this might seem to be the only approach and all that it is possible to do.

Work during the past three years by the Disaster Research Unit at the University of Bradford in inter-disciplinary applied social sciences has examined disaster-prone locations with consideration of the likely impact of disaster events on potential disaster victims. Drawing on previous scientific analyses of events of all kinds likely to occur in a specific location, the potential effect of possible disaster has been assessed in relation to the social and economic 'lifestyle' of population in question. In addition an assessment has been made of the awareness and response by individuals in domestic and official capacities to a continual hazard potential.

Perhaps for the first time all potential disaster occurrences for any one situation have been assessed at once, instead of being separated by mono-disciplinary scientific attention; and the probable effects of these events have been assessed as well as the causes of each. The total disaster potential has been realistically examined instead of being diluted by classification or separation. In one project[1] not only was the natural disaster potential of hurricane assessed but also the possibility of other disaster occurrence and included epidemic, aviation and maritime accident, industrial explosion, toxic spillage, fire and food shortage. This assessment was made out of an overall examination of social and economic activity of the country and an identification of 'disaster context'. Official and public awareness to disaster possibility was then examined and recommendations made for improved precautionary planning to deal with the total disaster potential.

Some recent conclusions by the Disaster Research Unit have suggested a change in the whole approach to disaster[2]. There cannot be disaster without people and disaster occurrence and disaster losses are on the increase without any corresponding increase in the occurrence of the phenomenon as disaster agent. Disaster occurs at the interface of natural phenomena and vulnerable human settlement, therefore the social and economic condition of that population is as significant as the natural phenomenon itself in any assessment of probable losses. If these losses have shown signs of increasing in the past, clearly the social and economic condition could be the cause. Furthermore, disasters are seen as an extreme manifestation of a continuous process and of an everyday situation. Preparedness must therefore be a continuous process and precautionary planning must be the result. Response after each disaster event is totally inadequate and the whole process of normal change and development must incorporate continual precautionary measures against disaster. These conclusions have a considerable and crucial bearing on the formulation of a methodology for precautionary planning.

First, it is the development process which has determined so far, and will continue to determine the socio-economic condition of settlements. Development planning must therefore take account of risk and probability of disaster occurrence. Moreover, development planning must take account of natural disaster probability, not only for its

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(1) LEWIS, J. (1975). A Study in Predisaster Planning. Occasional Paper No. 10, Disaster Research Unit, University of Bradford, and the League of Red Cross Societies, Geneva.

(2) BAIRD, et al. (1975). Towards an Explanation and Reduction of Disaster Proneness. Occasional Paper No. 11, Disaster Research Unit, University of Bradford.

own 'insurance' and protection, but because of its inherent capacity for either minimising, if it is aware, or exacerbating disaster losses if it is not aware of its effect on population migration and concentration of populations in hazardous situations. The population of Managua, for instance, considerably increased due to this process in the years immediately prior to the earthquake of 1973. These are clearly long term aspects of precautionary planning.

Buildings and other construction are part of the process of change and development, as it occurs, planned or unplanned, and death and injury are often inflicted from collapsing or disintegrating buildings in earthquake or high wind. The siting of buildings is usually considered, taking into account many advantages and disadvantages such as transportation aspect, relationship with like activities, and one essential aspect for more adequate consideration must be vulnerability to disaster events. Some situations will be more prone to damage than others. Seismic micro-zoning can determine probability of earthquake, topographical and hydrological examination can assess probability and vulnerability to flood and so on. The relationship between degrees of precautions in building construction and land use zoning can be closely aligned. In less vulnerable situations, less demand on construction need be made. These considerations are part of a regional planning and construction methodology and as such can be regarded as medium term precautionary planning.

Clearly, in the long term aspects of precautionary, or any other form of planning, decisions must be irrevocable if they are to be valid and effective. Considerable study, attention and effort are required therefore to assess the total range of choices and decisions that will constitute long term planning. In the medium term aspects, decisions are irrevocable to some lesser degree, but some improvement of existing building construction is possible even though siting is usually permanent. Thus, buildings that have already been erected can, if found to be necessary, be improved but the place in which they are located cannot usually be changed. Even though it may be agreed that this is the complete long term process that can, from the time of its implementation, reduce the vulnerability of future communities, the condition now of communities that have long been established in villages, towns and cities, many in any of a variety of vulnerable situations, must be assessed and catered for. San Francisco's imminent earthquake is widely known, but we must also include the villages of Swat, and of Northern Italy, and Nicaragua and Guatemala; and the river plain, coastal settlements and volcanic slopes of Honduras, the Philippines, Japan, Fiji, Northern Australia, etc., etc.

Long and medium term precautions are essentially physical in their application whereas some social precautions are more immediate and belong to short term aspects of precautionary planning. They consist of arrangements for the receipt and dissemination of warnings of imminent events and of advice about what to do on receipt of warnings both to the public generally and to particularly vulnerable communities or sectors such as elderly and infirm. This process of advice can usually be commenced with a programme of education for schools and familiarisation for the public generally on the anticipated phenomenon itself, what causes it, what it does, what effects to expect and how to prepare for them and this information can clearly cover some precautions to be taken in domestic building design, construction and maintenance.

These physical and social precautions can and must be taken in all situations known to be prone to disaster occurrence. The probability has to be accepted, and on that basis precautions can be taken to deal with a range of anticipated effects. There will remain a range of activities which, although foreseeable, will not be determinable in detail until the disaster event itself has occurred. These will involve rescue, transportation and care of the wounded, dealing with the dead, feeding and sheltering survivors and attending to the total variety of needs brought about and made necessary by emergency. These activities can be preplanned to some extent within the process of contingency planning.

There will always be a need for short term precautions because there will always be natural disaster however effective in the reduction of vulnerability long term precautions become. But without long term precautionary planning, short term precautions will be pointless in coping with disaster losses, <u>especially as these are increasing</u>. Short term precautions will be <u>seen to be</u> the most effective and mitigation of losses will appear to be the easier because of the long term increase and the mistake of assessing the effectiveness of short term planning only, in these terms, will be easily made. The alternative aim must be for the gradual effectiveness of long term precautionary planning to render the effectiveness of short term planning more difficult to demonstrate by a reduction in losses. That will be the signal of success of the total process.

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