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WHAT HAVE NEW ZEALANDERS LEARNT FROM EARTHQUAKE DISASTERS IN THEIR COUNTRY?

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Abstract

Although the threat of earthquake is a serious one in New Zealand, planning decisions often opt for crisis-response measures rather than for precautionary ones. Various compensation schemes have been established, but they would be quite inadequate in the event of a major earthquake. Lack of suitable liaison between local and overall civil defence authorities, and between these and the general public, would cause difficulty in a post-emergency situation.

Public attitudes towards earthquake threat are very complacent. They are based not only on an extraordinary unwillingness to acknowledge the existence of such threat but also on old habits of relying on Government to handle everything.

It is important that existing emergency measures be re-evaluated and that a comprehensive education programme be started as soon as possible.

INTRODUCTION

Although New Zealand is no longer a predominantly agrarian society, its history of urban development is relatively short and it has never been a densely populated country (12 per square kilometre, 1979). So, when disasters occur in New Zealand, the number of deaths and injuries and the amount of property damage is limited because the disasters frequently occur in geographical areas that are relatively unpopulated and undeveloped (for instance, the 1968 Inangahua earthquake; the 1978, 1979, 1980 Southland floods). Since 1848, when seismic events were first recorded, only a total of 288 deaths have been attributable, directly or indirectly, to earthquakes in New Zealand; and for a 33-year period, since the inception of the Earthquake and War Damage Commission, $NZ10 million in paid-out claims have been made. (A further $NZ20 million for earthquake damage since 1848 can be added to the previous figure to arrive at a realistic earthquake-damage estimate — the last figure represents the non-insured and the underinsured property damage.)

This small number of earthquake-induced casualties suggests that the minimal loss of life and property damage may be attributable to the population number, distribution, and less capital-intensive infrastructure found in New Zealand, rather than seismic safety regulations.

Regardless of these estimates, the earthquake threat in New Zealand is a serious one. Lensen (1979), for example, states that New Zealand society 'has collectively, either through ignorance or otherwise, succeeded in constructing its own death traps'.

Social science research conducted in New Zealand suggests there is a lack of commitment by decision- and policy-makers toward the earthquake threat and a lack of understanding of and indifference to the same threat by the general public.

INSTITUTIONALISED ADJUSTMENTS IN NEW ZEALAND RELATING TO EARTHQUAKE-HAZARD ABATEMENT

Regarding the earthquake threat in New Zealand, three responses can be identified: (1) there is a narrow range of institutionalised adjustments that has been adopted; (2) there is a strong preference for crisis-response rather than precautionary measures; and (3) the possibility of future occurrences of earthquakes tends to be downgraded (Britton, 1979b).

The institutionalised processes available in New Zealand society to reduce the earthquake hazard are more compensation-oriented than prevention-oriented. The prevention, relief, and compensation system that operates is represented by three separate organisations, but there are a number of implicit contradictions in each of these systems which tend to abrogate their capabilities. These systems are the building codes, the Earthquake and War Damage Commission, and the civil defence organisation.

Although each of these arrangements has been in existence for some time, the fact that they do exist has allowed organisational response and attitudes to be somewhat contradictory. The problems inherent in these arrangements are further compounded by the public response to disasters. Although the public has some knowledge about these three institutions, the attitude towards them, and towards the phenomenon the arrangements are designed to counteract, is one of complacency and near-apathy. It is an attitude of non-concernedness and is not attuned to prevention or relief. New Zealanders' indifference to mitigatory procedures stems from the assumption that any collective stress situation will be handled by the police, the civil defence, government, fire service, the hospitals, and the military. Unfortunately, none of these agencies fully shares this public view. Thus a situation prevails in which no agency really knows its own jurisdiction or that of others (Britton, 1977, 1979b, 1980a). This is heightened by the lack of coherent, inclusive planning, with very few simulations or 'dry run' practices to gauge the effectiveness of that planning other than 'paper wars' conducted in the bowels of Parliament, the location of the National Civil Defence Headquarters. This situation is further compounded by the political reality regarding disaster relief and rehabilitation. This aspect will be developed later.

The Building Codes

The NZS 1900 standard was revised in 1976 (NZS 4203) to help overcome some of the problems inherent in the previous building code. Although there was 'considerable difference of opinion between seismologists and geologists' (Suggate, 1979:3) over the appropriateness of NZS 4203, the

zoning regulations and areas of NZS 1900 still applied. This was despite prominent geologists and civil engineers stressing that the zoning was inappropriate, and despite the awareness amongst experts that the building codes were drawn up for political convenience rather than entirely on geological/seismological evidence.

These zoning regulations need thorough revision, free from political interference, before any building bylaws can become completely satisfactory as an anti-seismic guide. Further, the Building Codes are purely a recommendation for standard building specifications and are not legally binding on construction firms or local bodies, although some local governments are more active in this area than others. The New Zealand Government is still, as it has been in the past, reluctant to enact statutes enforcing the compulsory adoption of these regulations (Britton, 1979b; Lensen, 1979).

The Earthquake and War Damage Commission

The Napier earthquake of 1931 revealed the inadequacy of commercial insurance coverage in the face of disaster involving extensive property damage. There was considerable discussion after the 1931 earthquake (Eiby, 1975) about the need for a national insurance scheme to cover earthquake losses, but nothing eventuated, primarily because New Zealand was experiencing an economic recession (Parr, 1974:5). Further development occurred in 1941 when the War Damage Act established the War Damage Commission. Part of this act stated that any excess money in the fund could be used, subject to parliamentary consent, for assistance to persons experiencing losses from earthquakes or other natural disasters.

The 1942 earthquake in Wellington produced another development by creating a demand for earthquake insurance policies. These developments, combined with the statement of intent in the 1941 Act, led to the 1944 Earthquake and War Damage Act. This Act established a commission to administer an incorporated war damage and earthquake fund was financed by compulsory premiums on fire insurance policies (O'Riordan, 1971, 1974; Smith, 1961).

The Earthquake and War Damage Commission's jurisdiction has since been extended from one covering only earthquake and war damage, to now include an extraordinary fund which provides insurance cover for other natural hazard damages.

Three basic flaws are inherent in this compensatory scheme:

Firstly, the 'reasonable measures to reduce the effect of a disaster', is determined, not by the plight of the hazard victims, but by politics. In the three instances in which there has been adequate evidence for the commission to pay financial relief from the effects of hazard, the amount of compensation has either been non-existent or insufficient (Britton, 1980a).

Secondly, the fund, which on 31 March 1979 stood at $NZ369,559,723.00, is too small to compensate for damage created, for example, by a major earthquake. As an illustration: the capital city of Wellington could incur earthquake damages in excess of $NZ2,000 million if a large tremor struck (Britton, 1979b). This figure represents 14.28% of New Zealand's G.N.P. (1979 figures). It has also been estimated that the Wellington region has a return period of 150-years for a MM IX earthquake (Smith, 1976). The effect of such a tremor on the country's economy would be extremely marked (see Britton, 1979b).

The third flaw is concomitant on the second. Not only is the commission's fund too small to compensate policy-holders in the event of a large earthquake, but money is constantly being channelled from the earthquake fund to the extraordinary fund. Because of the frequency of other destructive natural hazard-agents in New Zealand, the extraordinary fund is becoming a drain on the accumulated pool of capital. If both funds are to be effective, the premium should be increased.

The problems inherent in this disaster insurance scheme are only just beginning to be realised (see, for example, the Report of the Commission of Inquiry 1980:149 – 171), but it is expected that no major revision of this scheme will be made for some time to come.

Civil Defence

The development of civil defence in New Zealand has been erratic, and it is only from the 1960's onwards that governments recognised that natural hazards, and in particular earthquakes, are a threat and should be planned for accordingly.

The realisation that some delineation of local responsibility for disaster situations was necessary arose directly from the 1929 Murchison and the 1931 Napier earthquakes, where authority in the immediate post-disaster phase was unclear and took time to establish, hampering the co-ordination of search, rescue, and relief operations. A similar situation developed after the 1968 Inangahua earthquake, but on this occasion the co-ordination of rescue/relief measures was more clearly defined than before, although the time-lapse between impact and immediate relief by external agencies was highly noticeable (Britton, 1979a).

Civil defence has provided an excellent theoretical structure through which national, regional and local community resources can be channelled to disaster-stricken areas. However, civil defence is something of a 'political football' in New Zealand. In theory, both the central government and the local governments are assumed to be in partnership for the implementation and provision of the civil defence role. Unfortunately, central government downplays its role in the provision of finance for civil defence and considers it a local government matter. Local governments, on the other hand, regard the financing and assistance of the local civil defence organisation as a joint affair between them and central government — with central government footing the bulk of the financial bill.

Social science research also suggests another problem area: There is a considerable lack of knowledge displayed by the public on the role of civil defence, particularly concerning when a disaster should be declared, and what authority Civil Defence has in such circumstances. This could be a major stumbling block in an immediate post-emergency situation (Bligh, 1972; Britton, 1977, 1979b; Brunton, 1979). In view of these findings, civil defence, both at a local and at the national level, should seriously consider a comprehensive educational programme to rectify an intensifying problem.

The impetus of post-earthquake adjustments has come from perceived threats, and as the general

public and decision-makers perceive no such threat at present (since there has been no great earthquake in a densely-populated region since 1931) allocations of funding for research and government support may be highly unlikely. As a direct consequence of this, the working adjustments that are institutionalised in New Zealand have so far been assumed to be effective, and their apparent success will give credence to the notice that further development of both the working and the potential range of adjustments is unnecessary. But what is rational from the point of view of an individual citizen may not be rational from a public point of view. Given that the private citizen may be indifferent to the earthquake threat, this does not excuse the government from responsibility. One essential problem with the public indifference to earthquake hazards is not that individuals decide, one way or another, to live without appropriate seismic-safety measures, but that such indifference contributes to the lack of political support for effective social action. Lack of public awareness and public indifference can be blamed on governmental inaction.

SOCIAL RESPONSE TO THE EARTHQUAKE THREAT

Many New Zealanders have never experienced a serious earthquake; for them it is an invisible hazard which is easily ignored. Low-magnitude earthquakes are frequent enough in New Zealand (Adams, 1977; Smith, 1976), and on the whole, earthquake damage is relatively slight. Earthquakes are even regarded with affection by some New Zealanders, as among the country's many exotic phenomena — 'the earthquake country'; the 'rocky isles'; '... an earthquake will announce itself upon arrival'. This lack of direct experience and the half-hearted manner in which many people regard earthquakes can be found at all levels of society.

Research conducted in New Zealand on earthquake threat suggests that New Zealanders are not prepared to the extent they could be or should be. Neither are the majority of New Zealanders aware of the full extent of earthquake-induced damage — it is usually something that happens to people in other countries. It seems that the awareness of the earthquake threat — when it is acknowledged at all — is, in itself, an insufficient stimulus for the taking of action; even the personal experience of a devastating earthquake does not imply that the individual has any greater 'real' perception of earthquakes.

Napier respondents did not view any hazards sufficiently threatening to intrude into their daily life routines; fewer than half of a surveyed population considered that the Napier region would again experience an earthquake similar to the 1931 shock (Bligh, 1972:21). In a survey in Blenheim, Rawlinson (1971) discovered that only 34% knew the year of the 1931 Napier earthquake, and only 54% could name the year of the Inangahua earthquake which was strongly felt in Blenheim three years before the survey was conducted. In Reefton and Newlands (Wellington), knowledge of the earthquake threat and abatement measures was 'sub-optimal' (Simpson-Housely, 1976, 1979). Following the 1968 earthquake in Inangahua, residents were adamant in saying that they would not experience any more destructive tremors because they 'had already received their big one'. This was despite the fact that the 1929 Murchison earthquake was markedly felt in Inangahua (Britton, 1979a, 1979b,).

In a study conducted in Christchurch (Britton, 1977) in which 23 organisations were selected for an examination of the implications of earthquake prediction, it was discovered that of these 23 organisations, only three had specific plans which were oriented to mitigate earthquake damage. The other respondents considered their fire-evacuation plans (which were outdated) sufficient for earthquake effects as well — an attitude that the researcher considered to be extremely myopic. Very few organisations had regular fire-drills, and none of them had ever practised simulation-drills based on earthquake-induced emergencies (Britton, 1977, 1978). The lack of awareness by these respondents to the emergency planning of other organisations was also highly noticeable: for example, only ten of the 23 organisational respondents were aware of civil defence planning for emergencies.

Although earthquake insurance is mandatory for all holders of fire insurance policies, there is a marked lack of awareness of this fact. In Britton's (1977) study, an overwhelming majority of respondents were either not sure or did not know if their organisations had earthquake insurance coverage. This situation can be contrasted to a survey conducted in California (Sullivan *et al.*, 1977) whereby only 14% did not know that such coverage was available, even though in the State of California it is not obligatory to hold earthquake insurance. This suggests a prevailing complacency amongst New Zealanders that may well extend far beyond this single factor (Britton, 1980b).

This complacency is also illustrated by the general public: In another survey conducted in Christchurch (Brunton, 1979), it was obvious that while the majority of respondents knew where to find instructions to assist them in a civil defence emergency (the back of the yellow pages in the telephone directory), very few had bothered to read this information. 'Looking in the back of the yellow pages' is almost a standing joke amongst New Zealanders. Yet, this attitude reinforces other suggestions that New Zealanders do not take the earthquake threat very seriously at all. There seems to be some very strong blocking mechanisms in operation that allow the majority of New Zealanders to disregard the natural hazard-agents that regularly and which will inevitably disrupt the normal flow of patterned social interaction. Geographical location is not connected in people's minds with the dangers that exist, particularly if these dangers are dormant or not highly visible (Simpson-Housely, 1976).

There are two major problems that need to be overcome before any preparation of earthquake abatement becomes fully accepted in New Zealand. The first is that the general public feels no sense of threat from the earthquake phenomenon. It does not create any necessity for political decision makers to implement comprehensive mitigatory procedures. The idea that the general public is complacent towards the earthquake threat appears to have some validity. If this is correct, the earthquake threat needs to be put in a more accurate perspective.

The second problem lies in the unjustified faith that New Zealanders seem to display towards public authorities. Individuals regard the situation as one in which they need not do anything about personally, because they assume that any emergency situation

will be taken care of by institutionalised agencies and organisations. As has been pointed out earlier in this paper, this attitude is not fully shared by the members of these respective agencies.

New Zealand society operates from a collective response by its members to any given situation. Although public opinion has, in the past, reversed bureaucratic actions, recent trends suggest that the involvement of the collective is not taken into consideration to the degree known previously. The movement towards the narrowing of the democratic base in decision-making may have implications for earthquake hazard abatement programmes. Because the majority of New Zealanders illustrate a complacent attitude to the earthquake threat, two possibilities may develop in this context: Either no policies will be developed that provide an overall mitigatory plan, primarily because there is little action at the grass-roots level, or the determination of actions will be decided by select parliamentary committees that will, in all likelihood, not take into consideration the opinions and wishes of the public. If these two alternatives are accurate, the outcomes will be similar — little or nothing will be done to reduce any impending earthquake hazard, owing to lack of public participation or acceptance of the necessity of planning.

WHAT CAN BE DONE?

It is apparent from the data at present available that New Zealand citizens are generally uninformed with respect to the earthquake hazard in their country and with respect to the most appropriate actions to take in the event of such a natural hazard. Some actions that will reduce this problem are:

1. Re-examining emergency measures for all earthquakes, along with emergency procedures for other kinds of disasters. The need for energetic national and local preparedness efforts and for workable emergency plans should be given special emphasis.

2 Beginning a more comprehensive and a more widely-dispersed education programme on seismic hazards and mitigation practices. Such a step would ideally allow all citizens to be aware not only of the effects and consequences of large earthquakes, but will also allow them to familiarise themselves with, and to practise measures that can reduce the impact of an earthquake, particularly away from home. An awareness of effective alleviating action that every person can adopt and use is perhaps more important than the knowledge of the effects and consequences of a devastating earthquake. A programme of public education should begin at once, even though there may be concern about continually alarming people about earthquake hazards.

3. More information should be made available to the New Zealand public, allowing them to know precisely what type of institutionalised hazard-reduction programmes are at present being practised, the effectiveness of these practices, and the limitations of these practices. This will help reduce the levels of inaccuracies that are prevalent with respect to such institutionalised hazard-reduction procedures typified by the building codes, the Earthquake and War Damage Commission, and the civil defence organisation.

4. The basic condition of existing buildings should be studied to determine their response to earthquakes of a given intensity and their vulnerability to seismic activity, to estimate the damage they are likely to sustain, and to evaluate the potential threat to life from their continued use in hazardous areas. Some action along these lines has been carried out by the Ministry of Works and Development, but the findings of their surveys are strictly classified (Britton, 1977). Such findings should be made public, particularly by a department that, in theory, is answerable to the public.

5. More studies on earthquake probability and hazard-mapping should be carried out. This action necessitates more government involvement in the allocation of funds to permit more intensive and dispersed research.

6. Further research should estimate probable future life loss, casualties and economic damage from earthquakes of different magnitudes and intensities in different areas of New Zealand. In addition, the implications of various types of damage, life loss and injuries should be studied.

7. Along with advice on disaster preparedness and hazard abatement, citizens should also be familiar with the longer-term social and economic disruptions that are inevitable concomitants to earthquakes similar to that of 1931

These and other topics should be discussed not only at the official decision-making level but should also be discussed at community meetings and involve representatives of appropriate government agencies, media representatives, and specialists in scientific, financial, and business matters. Involvement of the general public is essential if the public are to accept the necessity for preparedness, mitigation, and abatement of the earthquake threat which will inevitably entail inconvenience and sometimes costly hazard-reduction programmes.

Public education programmes have not been highly successful in the past. Nevertheless, a well-planned and imaginatively-constructed programme designed to relate to situations of immediate and tangible concern to the public may have a considerable impact on residents in an earthquake-prone country such as New Zealand (see, for example, Nigg, 1980). The inevitability of a potentially destructive earthquake in New Zealand in the near future dictates that such a programme be designed and implemented as soon as possible.

In New Zealand, the general conclusion that can be drawn from earthquake-related social science research indicates that the majority of New Zealanders are generally unaware of the earthquake threat and have not seriously contemplated the possibility of a severe earthquake in their area Thus, New Zealanders wait for their next earthquake disaster largely in a state of unpreparedness, but possibly not in a state of unexpectedness. New Zealanders seem to accept that disasters will occur in the future, but perhaps they do not so readily accept that they may be personally involved.

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