

And some changes, especially in certain forms of building construction and material, may have served to increase vulnerability to hazards where traditional practices would not have. Some of the more obvious changes have concerned building construction, but less visible changes have been similarly damaging to survival systems.

78. The selection, diversification, and location of crops have had to be adapted to the needs of cash-crop producers, and the ready availability of food aid has caused food producers to be less concerned about provision for emergencies. Adaptation in food crop production and management have disappeared as cash crops have replaced food crops altogether.

79. Historical analysis provides perspective on the cause and reason of change. During the eighteenth century in St. John's, the capital of Antigua, fires were more serious owing to timber construction and shingle roofs. Their seriousness led to changes to masonry construction for stores, churches, government buildings, and houses for the rich. In 1943 these were to receive the most severe destruction and damage, from which, it was observed, buildings of timber largely escaped (annex 2). The masonry external walls of some large houses were demolished leaving the timber internal walls standing to support the roof. As part of development planning strategy, useful experience of this kind as well as hazard awareness should be maintained. This is relevant not only to development options but also to post-disaster intervention and disaster relief (section B.5).

80. Although it may be governments which are the most readily enticed by post-disaster assistance, it is at the local level that disaster causes the greatest deprivation and hardship. Options for positive adjustment processes at the local level may be hindered or removed by the actions of central authorities; and it is in this context that insurance should be viewed (section C below).

#### 4. Natural disasters and tourism

81. The fascination of risk is doubtless a source of attraction for tourism, especially in respect of visually dramatic phenomena such as volcanoes. At the same time, visits to volcanic craters or to ruins are of incidental interest to tourists, who would quickly choose alternative locations if their first choice were to become the sudden victim of eruption or earthquake. By and large, though tourism is a highly sensitive industry, it quickly recovers from interruption imposed by a disaster and can even, on occasion, capitalize on it.

82. As for health risks, tourism may itself be a source of epidemics and disease. Tourism is often of large scale in small islands and small communities, with comparatively large numbers of tourists visiting at one time. In the event of natural disaster, tourists require special attention in preparedness plans, and careful integration into local contingency planning, if they are not to become an embarrassing burden to their host countries.

83. Much more serious concerns arise out of some tourist developments on small islands. Often coastal resort development implies change to the natural protective features of dunes, reefs, mangroves, and trees; and in addition to placing the island in a position of high risk to sea surge and storm, development may remove former natural protection that indigenous populations once enjoyed.

84. In allowing these developments to take place for probable economic benefits, governments must take measures to exercise control for environmental reasons and must be prepared to assign some expenditure and administrative resources to extended contingency planning for often remote and temporary populations.

## 5. Disaster relief

85. Doubts and concern about some side and long-term effects of disaster relief have been expressed ever since the concept was born out of the early missionary and trade activities of the colonial presence (annex 11). The colonial administrations were more concerned about damage to government property and to loss of export production than about damage sustained by "natives" or indigènes who, in the early years of colonization, were better adapted to looking after themselves.

86. As colonial systems and indigenous populations and practices integrated, a larger proportion of the population became dependent on the administration as a source of work and cash, as well as relief after disasters; and a wider population saw the advantages of post-disaster benefits (annexes 6 and 7). Expatriate colons and planters regarded post-disaster assistance as their right. Their estimates of damage and loss may have anticipated the administration's zeal in reducing their claims.

87. In respect of disaster relief, colonial administrations appear to have been neither a malevolent nor a benevolent extension of their metropolitan power. Both the French and the British administrations were obliged to petition and negotiate with Paris or London for the terms of post-disaster assistance. It was generally not grant aid that was given, but credit which had to be repaid to the metropolitan government (annexes 2 and 6). Evaluations of damage and loss, made in the first instance by local administrators, were usually re-assessed - normally downwards, except perhaps for the needs of the indigenous population - by visiting assessors (annex 6).

88. Grants and loans were made with stipulations on how and where they were to be spent (for example, that government buildings should be repaired). Terms for repayment were regarded by the disaster-stricken islands as an onerous burden, often a point of concern for successive governors and their negotiations with metropolitan governments (annex 2). However, guided by metropolitan interests, rigorous apportionment of post-disaster assistance embodied a discipline which has since disappeared from disaster-relief management. Though the same discipline may now be difficult to achieve by post-independence exogenous or indigenous agencies (and though it may be undesirable in some respects), it did ensure a specific identification of need and a rigorous integration of assistance with those needs - an integration that is often lacking in present systems. Precisely identified post-disaster needs may not always have been wholly met, but neither are they by current systems. Though there was some impatience by metropolitan powers concerned by the amounts of assistance that were being granted (annex 6), there was also the underlying view that disasters were a normal part of life in the colonies which had to be borne out of their own current funds, and by indigenous systems of adaptation.

89. Current criticisms of the negative effects of disaster-relief - increased dependency and vulnerability, disrupted market values, induced fecklessness and debilitated self-reliance - can be all the more pertinent in small countries. Not only are the effects of disaster proportionally greater; so are the effects of disaster relief, though disaster and relief may not be in proportion to each other. Disaster relief may be a cornucopia at the national level, but the disaster is largely experienced by individual communities at the local level. Some non-governmental field agencies are striving to modify their practices to take this potential conflict of interest into account.

90. The apparent eagerness with which disaster relief and emergency assistance (especially financial assistance) is accepted may, however, be as much a result of shortcomings in the development aid system as it is of the relief system - and of the separation of the two. Small countries, and even more so smaller units within small countries, lose out where economies of scale in aid and its administration are being sought by donors. Small wonder then that relief assistance is sought by governments for developmental purposes in these situations.

C. Insurance and funds

1. Natural disaster insurance and developing countries

91. Insurance is a commercial and financial arrangement dependent on a participant's willingness and ability to pay certain premiums. Where there is not the willingness and ability to pay premiums, little of the discussion about insurance against natural disasters is directly relevant. Insurance may seek to introduce financial concepts for evaluation and compensation, where none existed previously. Alternatively where insurance systems are obliged to depend on existing financial systems, and willingness and ability to pay, it may become a medium which reinforces the separation between those willing and able to pay, and those too poor to be able - even though they might be willing. The separation that may ensue is obviously between the rich and the poor. It occurs less obviously between local (rural) levels and the central government level - where government is the only relevant sector for such financial arrangements. Government is a sector vulnerable to heavy physical damage and therefore to high costs which can be evaluated. Community and domestic damage is less easily evaluated, evaluation is less relevant, compensation is less significant - and premiums therefore less relevant, though representing a greater burden.

92. Why should those with money be the ones to benefit, when the poor are repeatedly identified as the most vulnerable to natural disaster? If the poorest and smallest units are known to suffer the highest proportional loss, at domestic, community, province or country level, it is surely a drawback that insurance can more easily be applied to the largest and richer units. Where commercial insurance becomes possible, for example through the intervention of government subsidies to keep premiums to an acceptable level, who is to receive benefits and in what proportion? How is compensation to be assessed where property evaluation remains elusive or impossible; and where property may represent only a small part of a victim's over-all loss, which may be crippling (see annex 11).

93. Most seriously, what effect is the intervention of financial arrangements for compensation to have on cultural and traditional adaptation to hazard? Will financial compensation introduce disregard for hazard in the knowledge of compensation after disaster? Will insurance become a medium by which damage and loss may increase? Will those who do not maintain property stand to gain more from damage compensation than those who do?

94. It is clear that in developing countries, where technological and social systems are different from those of developed countries, insurance cannot simply be superimposed. If it is to have any use at all, insurance must be integrated into the existing needs and systems of the developing countries. This may mean that the very commercial principles upon which the insurance industry has come to depend may have to be modified. There is certainly considerable scope for modifying the way in which natural disaster victims participate in the benefits.

## 2. Commercial insurance principles

95. Commercial insurance has long been recognized as a medium for natural disaster mitigation, but natural disasters have also been recognized as the potential cause of severe losses for the insurance industry. There are great difficulties in bringing commercial mechanisms designed for frequent small losses to relate effectively (and profitably) to rare catastrophic losses. Insurance for traditional risks in life and fire insurance was designed according to the following constraints:

- (a) the insured event has to occur with a certain regularity, in a certain period of time;
- (b) the damage sustained must be measurable; it must be possible to calculate the probability of occurrence and the degree;
- (c) the risks must be spread geographically;
- (d) the amount of damage must be limited.

Natural disasters, earthquakes and hurricanes especially, do not fit into these constraints, and thus cannot be dealt with by traditional insurance systems. In certain developed countries, it has been possible to provide for some degree of natural disaster risk by adding special risks on the back of insurance; and in some cases, government subsidies have ensured that premiums have been kept to acceptable levels.

### 3. Government participation and reinsurance

96. The participation of governments in direct compensation for natural disaster has been on the increase, but the involvement of public funds for the insurance of private property has itself raised further problems. Many uninsured victims of damage have turned to government funds for assistance, and governments have been increasingly obliged to respond. This in turn has served as a disincentive for the purchase of insurance by the public. How much, it has been asked, should disaster be treated as a public responsibility, and should residents of hazard-prone areas bear the financial cost of living there?

97. This kind of question implies a knowledge of, and an accessibility to, choices and options concerning location and relocation not applicable to many populations of less developed countries, and even less applicable to populations of disaster-prone and less developed island countries. In small countries there is often no permanent escape in relocation within them, even if relocation is possible.

98. The moral and political issues of governmental involvement in insurance for natural disaster in less developed countries are complex enough, but the financial questions are even more difficult. Without resources governments cannot be involved, however much they may want to be. Add to this paramount problem those concerning the need for a developed insurance industry, the imbalance of risk distribution for multi-hazard insurance, the need for insurance to be made compulsory; the need for insurance to be additional to humanitarian relief by governments, the evaluation of property to be insured, and the applicability of natural disaster insurance in less developed countries becomes even more remote and impractical.

99. Some form of international subsidy would be required to make it possible for governments of less developed countries to be involved in simplified insurance systems. Such international subsidy would operate in a way comparable to commercial re-insurance; it would be an international medium for the sharing of risk; and a medium also for the initiation and implementation of programmes for natural disaster mitigation. Insurance systems for operation by governments would need accompanying guidelines for compensation distribution by governments within their countries.

100. Insurance is traditionally risk-specific; and vulnerability to risk is conceived as a retrospective evaluation. That is to say, risk is assessed after the construction or establishment of certain activities and practices in a hazardous location. On the basis of that risk, insurance premiums may be assessed taking into account the anticipated frequency of prevailing hazards and the location, nature and quality of construction and use.

101. Though there may be sufficient data at national levels to determine a chronology of damaging events, there is usually insufficient relevant information on specific material and financial costs of damage to permit projections of future disaster impact. Insurance schemes remain therefore at the governmental level only, where governments are willing to participate, because they represent the national level at which existing data is relevant.

### 4. Crop insurance

102. Crop insurance, in its negative and positive aspects, has been the subject of special study and some special insurance programmes have been initiated. Crop insurance is seen by some as providing a medium by which farmers might be encouraged

to increase production once inherent risks could be set aside. Risks can be spread among many farmers, through diverse regions and over time. Again, in order to keep premiums at an acceptable level, some form of subsidy is necessary in less developed countries. Governments of the poorer countries are unable to participate, and commercial re-insurance is either not feasible or too costly. Some form of international assistance is required for widespread applications.

103. A leading but almost unique example of crop insurance has been managed in Mauritius for 35 years. A significant conclusion of reports on the system is the predominant need for re-insurance cover. (annex 13).

## 5. Regional schemes

### The Caribbean

104. In 1971, 14 Caribbean Governments requested the United Nations Development Programme (UNDP) to provide assistance for a regional insurance organization to provide cover against damage caused by hurricanes and tropical storms. The project was deemed to be feasible, but it required additional information from the participating Governments. UNCTAD collaborated in setting up a project study group, but nothing came of the proposal.

### The South Pacific

105. In 1976 the economic arm of the South Pacific Forum, the South Pacific Bureau of Economic Co-operation, established a regional Disaster Relief Fund (annex 14) with the co-operation of the Commonwealth Secretariat. Since the Fund operated, between Governments, at national level, the guidelines for the Fund were able to avoid many of the problems involved in the application of commercial insurance principles at domestic levels, such as feasible premiums, evaluation of property to be insured and incentives to purchase policies. The guidelines were wholly based on assessments of disaster frequency at national levels throughout the South Pacific region represented by the nine initiating countries. The Fund is a form of mutually provided and shared disaster relief. Contributions are given by Governments, administered on behalf of Governments, and benefits are similarly received and administered by Governments. Inherent advantages are that the relief is committed immediately upon request, and it is wholly spent within the subscribing region. It was additionally recognized as the "oil for the machinery" to make indigenous resources available among member countries, which might well be given free of charge, across often vast distances involving transportation which is very costly. Except for a small administration requirement absorbed by the SPEC Secretariat in Suva, the Fund has no field inspectorate, no regional offices, no separate headquarters, and therefore few overhead costs.

106. A principal disadvantage of the Fund is that, without financial backing from donors outside the region, or without re-insurance in some form, a disproportionate amount of contributions to the Fund have had to be allocated to Reserves - and only one third to the Working Fund. This has placed a severely low limit on the amount available for each disaster and on the direct practical usefulness therefore of contributions. International backing is required to release to the maximum the 'self-help' potential of the Fund. This has not been forthcoming.

107. It was recommended that the Fund should make itself the catalyst for regional and national disaster preparedness because it was felt that, by not taking measures to mitigate disaster at national and subnational levels, a member country could become a liability to the Fund. In 1978 Tonga, a member of the Fund, requested a project for disaster mitigation and preparedness.

## 6. The future of disaster insurance

108. Recently there has emerged a wider realization of the disaster insurance needs of less developed countries and of the shortcomings of the insurance industry in its ability to meet them. The emergence of regional groupings, and regional Funds, should make easier the identification of international re-insurance objectives and resources and their application at government levels. There remains the need to adapt insurance to requirements at local levels in less developed countries.

109. Insurance could assist in international sharing of losses, increased production, the improvement of housing, and price stabilization. It could and should become an integrated component of institutional and socio-economic development, recognizing natural disaster as a component of environmental reality.

110. What is needed are methods for assessment or prognoses of damage which may result from the known temporal distribution, and projected recurrence, of damaging events. This requires not only temporal and spatial analysis of past events, but field measurement of distribution, type, quality, and construction of properties and activities. There are a number of proposed methods for risk measurement based on social as well as technological factors, which will allow risk to take account of other than structural features and where property will be assessed only in its appropriate social context.

111. By permitting tax-free reserves to allow re-insurance to accommodate catastrophe losses, and by the authorization of free transfer of currency, governments of developed countries can continue their co-operation with self-help incentives in less developed countries. By so doing they will greatly increase the geographical scope and effectiveness of an emergent concept.

## D. Conclusions

### 1. The need for holistic national strategies

112. There is no panacea common to all island countries simply because they are islands; but smallness underlines the importance of holistic planning. Above all there is the relationship between disaster events, effects and aftermath, where measures taken in response to one disaster may introduce vulnerability to another (for example, fire in wooden buildings caused a shift to masonry buildings which were to suffer greatest damage in earthquake (Antigua: annex 2); earthquake damage to crucial water supply systems on Fogo (Cape Verde Islands: annex 5); and the postponement of reservoir construction until the earthquake loan had been repaid (Antigua: annex 2)).

113. The more frequent events are the creators of underlying conditions for the rare events; the more frequent they are the more normal they appear to be. A population suffering from epidemic or even low standards of health or nutrition might be slower to rehabilitate after hurricane or earthquake. What is regarded as normal is influenced by frequent or endemic hazards, and conditions of all kinds influence the economic and social effects of disasters. Awareness of the related nature of conditions brings a realization of the need for an inter-connected strategy, because, without a comprehensive and holistic approach, measures taken in one sector may well cause vulnerability to shift to another.

### 2. Shortcomings of economic evaluations

114. Thus it is that assessments of the economic viability of each measure on its own become academic without the context of an over-all strategy. In any case,

economic viability of undertakings is often difficult to achieve in small island economies. <sup>8/</sup> If economic viability is not assessed, how can additional and separate measures to counter disaster be economic?

115. But there are more serious questions concerning economic assessment of disasters and disaster response. Against phenomena that respect neither territorial nor disciplinary boundaries, how can any mono-disciplinary strategy be effective? Classical economic development has been largely inadequate as a means of improving the quality of life or social well-being and security. Economic assessments of disasters are unable to take account of the enormous social cost; and economic considerations account for the smaller proportion of disaster impact on developing countries. Were it possible to achieve real economic viability, or positive commercial balance of payments in least developed disaster-prone countries, the social cost of disasters would be largely unaffected. "Development" conceived only within the confines of economics during colonial and recent history has failed to reduce disaster impact.

116. Habitation of some island countries came about entirely through colonial exploration (Cape Verde); and habitation and population of others was increased by emigration from the colonial metropolis, by the importation of slaves, and by the development of export economies (Cape Verde, Antigua and Barbados, Comoros). These processes were encouraged regardless of environmental hazards; disasters that occurred were grudgingly and only partially compensated by the metropolitan power, to whom repayment was usually due, and they were largely ignored as a constraint. The social effects of disasters were ignored to an even greater extent by the metropolitan power, or left to voluntary relief efforts where these existed. Relaxation of purely economic considerations would allow the integration of social factors into cost-benefit evaluations. Furthermore, environmental considerations, so crucial to island development, would more easily achieve incorporation in a comprehensive development spectrum.

117. Modifications of this kind would require modified monitoring and accounting systems. The dearth of disaster accounting, and the difficulty of accurate evaluation of disasters from existing accounts, is one very real reason why the present system of economic evaluation of development continues to ignore disaster effects. They are indiscernable in the present system in which economic effects are conjecturable at best, and then only rarely. Where they appear at all they are temporary and recovery is speedy, and interest in economic continuity and growth is quickly regained. Social effects are by-passed because they are not recognized by the system.

### 3. A developmental context for disaster mitigation

118. Natural disaster vulnerability is a holistic reality, and requires holistic strategies on the part of national governments and international agencies. It is impossible to dissociate famine risk from development of Cape Verde and yet at least one United Nations agency project did so in proposals for mineral water export development. Famine will not go away if it is ignored. Nor will disasters caused by earthquake, hurricane and volcanic eruption. Holistic strategies are required for all hazards at a place. But countless development projects, programmes and reports ignore disaster events and disaster potential, or are wholly inaccurate concerning them.

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<sup>8/</sup> c.f. Aspects of the viability of small island countries, a consultant study by Prof. F. Doumenge, TD/B/95C.



119. A recent survey of disaster preparedness and experience in the South Pacific states:

"With few exceptions, national governments and development assistance agencies have not incorporated disaster preparedness into development planning. A review of the most recent development plans for the countries and territories or the regions shows that natural disasters are not mentioned at all - much less their long-term or short-term effects." 9/

Islands are eminently qualified as a venue for developing and testing a multi-disciplinary and multi-sectoral methodology. In small islands, events and processes can be seen to have an effect on each other; and in islands they are most easily identified, tested and integrated as a viable strategy. Not only is a holistic approach most necessary therefore; it is also the most possible.

120. The Economic Commission for Latin America provides an almost unique official insight into the developmental context necessary for disaster mitigation. An evaluation of damage caused by rainstorm in Grenada 10/ points to the essential need for expenditure, small though the amounts involved may be, on maintenance of roads and bridges in order both to keep disaster damage to a minimum and equally to improve transportation and reduce overheads for agricultural marketing. The same document also called for "massive" injections of capital to improve the total system and to initiate a developmental approach to ameliorate all the needs exposed by disaster. Comprehensive development planning was called for, embracing environmental, conservationist, infrastructural, physical, economic and social perspectives and their integration into relief programmes and rehabilitation funds, for which there would be no lack of donors.

#### 4. Preparedness and disaster-relief integration

121. The integration of disaster relief and rehabilitation funds and goods into the development process is vital for the maintenance of economic and ecological (social-environmental) balance in the aftermath of disaster. In island countries the scale of relief input is likely to be very high, especially when, as is often the case, there are strong international political or strategic motives for the relief. For integration to be effective, comprehensive development planning must be undertaken incorporating hazard constraints in readiness for disaster. Such measures require an extended developmental interpretation for disaster preparedness and not only the identification of infrastructural requirements for improved preparedness (transport; communications; medical facilities). They include post-disaster evaluations of earlier efforts, and of the effects of disaster on the processes and conditions of vulnerability to subsequent disaster of the same or different kinds.

122. Historical perspective and historical analysis are essential for understanding the economic and social processes which have led to conditions of vulnerability. The direction which development has taken in the past can guide future priorities for economic, social, and environmental balance (e.g. the emergence of drought and hurricane as priority hazards only after successful health and nutrition programmes in Somoa; and the need to tackle normal conditions as factors underlying vulnerability before giving priority to the most dramatic and rarer disasters (population: see Somoa annex 12; crops; see Antigua, annex 1)). Over-response from the outside to the

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9/ Hamnett & Franco (1982) (see bibliography).

10/ ECLA, "Evaluation of the damage caused by the Grenada rainstorm and its implications for economic development" (E/CEPAL/CDCC/7).

seemingly rare event of high impact is often clear from a study of recent disaster history. Without historical perspective, how can the local significance of disaster be judged? Without historical perspective the way is open for disaster opportunism by prospective recipients, and for disaster imperialism by over-eager donors.

5. Natural disasters a cause of low level of development?

123. How much have natural disasters contributed to the condition of "least developed" among the island countries of that category? No matter to what degree the impact and aftermath of natural disasters have disturbed the fragile economic and social equilibrium of these countries, the effects have been temporary. All have recovered to resume their continuum of low development.

124. The economic impact of natural disasters has been temporary, and fluctuations have been no greater than those caused by other factors, both before and afterwards. Countries have recovered, albeit with assistance which they were often required to repay (annexes 2 and 6). Economic effects have been most severely felt when the economy was in a state of decline, as a result of other factors (annexes 2 and 6). The commercial and economic decline of Cape Verde has had a wholly different history. The eventual demise of slavery had a far greater impact on the Cape Verdian economy than did famine, the high mortality of which was at the time closely dependant on an inflated population resulting from slavery. Similarly, though on a smaller scale, in Antigua and Barbuda the burden of earthquake loan repayments was all the greater in that it coincided with the efforts of the sugar industry to recover after the emancipation of slaves.

125. There are now two schemes to compensate for export production shortfall applicable to most developing countries, (the IMF Compensatory Financing Facility: CFF; and the STABEX scheme of the EEC, applicable to the ACP countries) these two schemes can accommodate shortfalls due to natural disasters; and natural disasters should not therefore be separated as an element for special treatment. The actual assessment of shortfalls will take natural disasters into account, and this has parallels with some insurance and reinsurance systems. Shortfalls compensation should be by commodity, as after disasters some sectors show gains while others show losses.

126. Underlying economic and social conditions have counted more for the effects of disaster upon them than disasters have accounted for the subsequent level of those conditions. Though economic impact has been temporary, social cost has been high. Deaths are irrevocable; homelessness, deprivation, misery, and injury may be transient but are largely avoidable by environmentally appropriate development - not solely by economic growth.

127. Because inadequate or inappropriate development can aggravate the economic and social effects of disaster, the demand is the greater upon disaster relief resources and upon the exploitation of disaster to augment development assistance. Long-term evenly programmed development assistance that included a disaster mitigation strategy would be more cost-effective to donors and recipients than erratic injections of over-responsive or ill-considered disaster-relief. Budgets for development aid and emergency aid should reflect this need for a practical balance.

6. Lessons for larger countries:

123. Much of this study in respect of natural disasters in least developed island countries contains valuable lessons for natural disaster mitigation in larger countries. However, the relationship between conditions and events is less obvious in large countries, and requires more careful analysis for its identification. At the local level in large countries all things come together as they do at the national level in islands. Rural areas are the most vulnerable to natural disaster; disaster on a national scale comprises many simultaneous disasters of local impact, and methodologies and strategies developed for island countries have relevance for larger countries at local levels.