The Newsletter of
INTERNATIONAL HAZARDS PANEL

A Panel of the Intermediate Technology Development Group
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CALL FOR PAPERS

Contributions are invited for the following:

1. **Annual Panel Workshop** to be held on 24 and 25 October at Oxford Polytechnic. The planned theme is "The Role of Non-Governmental Organisations in Disaster Mitigation", but papers from a wide range of viewpoints and disciplines are welcomed. It is hoped that the main papers will subsequently appear in a special issue of *Appropriate Technology*, the journal of the Intermediate Technology Development Group to mark the start of the International Decade of Natural Disaster Reduction.

2. **Newsletter No.5** which is due in November 1989: main papers, short papers and field reports, members news and abstracts are all welcome. The quality of the next newsletter depends on your response.

3. **IHP Occasional Papers** will be a new venture. Many members will have written reports which have limited circulations but which in modified form maybe of more general interest. We hope to make suitable papers/reports available to a wider audience and any work in the field of hazards would be welcomed by the Newsletter editors.

All contributions and editorial correspondence should be sent to:

Dennis Parker & Paul Thompson  
International Hazards Panel  
Flood Hazard Research Centre  
Middlesex Polytechnic  
Queensway  
Enfield  
Middlesex  
EN3 4SF

CHANGES TO THE PANEL

This issue of the Newsletter has, like previous issues, been sent to everyone on past membership lists for the panel. But will you receive the next issue?

Longstanding panel members will have noticed changes in recent years - particularly the start of the Newsletter, and now the change to a less tongue-twisting title: *International Hazards Panel*. Although the panel has requested a membership fee for several years many people have not paid, although more have paid in recent years. While this was acceptable in the past, the Newsletter costs money to produce and we cannot afford to send it to people who do not pay for membership.

As many members will know one of the Panel's main aims is to act as a network between those interested in hazards and risk reduction. To help in this process a membership list is enclosed with this newsletter, it identifies those who are
currently paid up (thank you!) and those who have not yet paid (read on). A membership renewal/new members form is also enclosed.

MEMBERSHIP

Following Panel meetings on 22 March and 30 June 1989 administration of membership is now run from Middlesex Polytechnic. Annual Subscriptions run from 1st January and are:

- Ordinary member £10
- Discount for students and members from third world countries £5
- Institutional membership £20

PAYMENT MUST BE IN POUNDS STERLING ONLY, made payable to MIDDLESEX POLYTECHNIC, the costs of converting payment in any other form make such subscriptions uneconomical. Subscriptions and membership correspondence should be addressed to:

Celine Ottmann
International Hazards Panel
Flood Hazard Research Centre
Middlesex Polytechnic
Queensway
Enfield
Middlesex
EN3 4SF

Members receive two issues of the Newsletter per year, minutes of panel meetings and are invited to attend meetings and the annual Panel Workshop.

We are grateful to all those members who have already subscribed, and will carry over their membership appropriately for the subscription received. We also apologise for the confusing range of membership details in past newsletters and minutes, however the new system should ensure some continuity.

PANEL OBJECTIVES

1. To exchange information

The Panel seeks to provide a reference group for representatives of all disciplines, any country and any organisation with a serious interest and commitment to the understanding and adoption of risk reduction techniques in hazard prone areas. The Panel seeks to facilitate the dissemination and exchange of information and the sharing and transfer of experience on risk reduction in hazard prone areas. The Panel seeks to encourage the transfer of knowledge and experience between Panel members and especially the two-way flow of information between members in developed and developing countries.
2. To raise consciousness of, and to promote, risk reduction techniques

The Panel seeks to increase awareness and knowledge particularly of preventative risk reduction techniques, firstly amongst a) its members, b) those responsible for making investments in urban and rural development projects in disaster prone areas, and c) those living and working in disaster prone areas. Secondly, the Panel seeks to share knowledge and experience of disaster mitigation techniques amongst a) representatives of different disciplines, and b) those with different experiences of disasters and disaster mitigation.

3. To promote mutual support between Panel members and others participating in disaster mitigation

The Panel exists in an important part to encourage and help facilitate the mutual support of Panel member's various interests and initiatives which are designed to achieve objectives 1 and 2 above, whether they be directly promoted by the Panel or otherwise agreed by the Panel. Panel members are encouraged wherever possible to promote the Panel and to undertake initiatives agreed by Panel members in the name of the Panel.

INTERNATIONAL HAZARDS PANEL

GENERAL STATEMENT

The Panel exists to reduce natural and technological hazards in communities most at risk. The Panel works primarily as an information exchange and seeks to promote the transfer of knowledge and experience on disaster mitigation between scientists, academics, consultants and all those involved in disaster management.

The Panel was formed in December 1980 and is one of several Panels of the London-based Intermediate Technology Development Group founded by Dr E Schumacher in 1965. The Panel has 124 members in 29 countries.

The Panel membership is multi-disciplinary notably comprising architects, anthropologists, building scientists, earth scientists, economists, engineers, geographers, lawyers, planners, risk analysts, sociologists, other social scientists and specialists in relief and development studies.

The Panel is concerned with all approaches to disaster mitigation but seeks particularly to promote preventative planning in disaster prone areas through a multi-disciplinary approach incorporating, education and action; helping communities to organise themselves, low-cost and self-help tools; and improved communication between scientists, administrators, planners and the disaster prone.
EDITORIAL

In this issue we welcome members of the Development Studies Association. The International Hazard Panel now also forms the Disaster Studies Group of the DSA and we hope that this link will benefit both the panel and DSA. Details of the DSA are available from the Internation Hazards Panel Chairman:

James Lewis
Datum International
101 High Street
Marshfield, nr Chippenham
Wiltshire SN14 8LT.

The welcome to new members has been ommitted in this and the last newsletter, but we are pleased to welcome those members who have joined in the last year and who are included in the enclosed membership list.

This Newsletter has a theme of some of the hazards which are already becoming more apparent due to climatic change. It concentrates on the hazards facing two groups of small oceanic islands whose very existence may be threatened by the rises in sealevels which are currently being predicted.
ENVIRONMENTAL HAZARDS IN THE MALDIVES

David Oakley

Physical Setting

The Republic of Maldives consists of a narrow archipelago of coral reefs and atolls in the Indian Ocean lying on a north-south axis with its mid point some 650 km south-west of Sri Lanka. The archipelago is the largest coral reef system in the Indian Ocean remote from the influence of the continental land masses.

Within each atoll is a complex of sand banks and reefs, many of which support islands of vegetation. Within the atolls, water depth is about 60 metres although within 5 km of some atolls, depths in excess of 3000 metres are recorded on charts. On average the islands are 0.9-1.5m above sea level. None are over 2 metres. The tropical vegetation on the islands is dominated by coconut palms, breadfruit and screwpine trees. The main occupation of the islanders is fishing. Tourism is of increasing economic importance.

Only 202 islands of the 5-6,000 reefs and sandbanks in the archipelago are inhabited. Male', which is the capital island, with an area of a little over a square mile, is the home for more than 45,000 people out of the country's total population of 195,100 (1987 estimate). Male' is the commercial, administrative and also the communications centre of the country. The country's only international airport is located on Hulule island - a mile from the capital Male'. The island is used solely for that purpose.

Visitors to the Maldives are first struck by the low height of the islands above sea-level. In geography and economy there are many parallels to be drawn with the Southwest Pacific Islands (Oliver, 1988).

Geological History and Setting

The Maldives originated from the formation in ancient times of a submarine mountain ridge, evolving from a fault system within the seafloor. Coral growth initiated along the ridge has developed to form the present island. The near-surface geology, as it affects the future development of Maldives, is composed entirely of coral and its derivatives. Basement rocks exist only at great depths.

Normal maintenance or increase of the reefs and islands depends upon the rate of production of limestone by corals and other marine organisms. If this production is greater than the rate of destruction by natural forces, such as burrowing or boring plants, sponges and shells; and the rate of dispersal by currents and waves carrying material away to deeper water, then the reef or island will grow.
If human action alters the natural balance by removing significant amounts of material, so altering currents that even more material is swept away; or by polluting reefs in ways that may effect the natural rate of production of limestone; then the delicate relationship between nature's production and destruction may be changed. The risk of damage is acute when there is mining of coral for construction of sea walls; or reclaiming of land is carried out without an environmental impact assessment being undertaken.

Meteorological and oceanographic setting

The Maldives climate is tropical with diurnal maximum temperatures in the range 26-30°C. The North-East monsoon brings gentle, generally dry winds from November to March. The South-West monsoon, from May to October brings stronger winds and rains. The tidal range of about 1-1.5 metres generates currents particularly in the deep channels between tightly-packed reefs on the margin of atolls.

There is a particular interest shown by biologists and ecologists in the Maldivian Archipelago since it has presented a very stable environment for the development of a major system of coral. By comparison other large reef systems are subject to terrestrial influences, cyclonic storms and large tidal ranges.

The big waves

The long held relative stability of the islands has recently been disturbed by a still largely unexplained natural event. This was followed soon after by two recurrences of lesser magnitude. The sea, which until now was seen as being the benefactor of the Maldives, is now also seen as being potentially a threat to its very existence.

Although the islands are low-lying, they have seldom been attacked by big waves and high-water tides. There had been a few incidents where a degree of coastal flooding occurred during a peak tide. But, in April 1987, big waves threatened to swallow parts of the beach areas of several islands, including Male', and inundate others.

The high water experienced during 10-12 April 1987, caused much damage to the capital Male', to the international airport at Hulule, and also to a number of outlying islands including resort islands in Male' atoll.

A large portion of the reclaimed land in Male' was either washed away or submerged. A significant length of the retaining wall on the eastern sea front of Male', and almost the whole retaining wall on the southern sea front of Male', were eroded and washed away. High sea swells lashed against houses on the sea front smashing walls and destroying some houses. The garbage disposal compound located in the southern end of Male' was badly damaged and the refuse spread to the
surrounding areas, this lead to an outbreak of serious diarrhoeal diseases.

The damage to Male' International Airport island was serious. The retaining walls on the eastern and southern sides were wrecked, leading to flooding of part of the runway. Waves lashed against the southern tip of the airport and as they receded swept sand out to sea, weakening the underlay of the runway. Some of the approach lights of the airport were damaged, while the AFTN antenna was completely uprooted. Sections of the harbour breakwater collapsed and the seaward end of the fuel jetty was damaged.

Government response

Following the April wave damage the Maldives Government instituted immediate measures to alleviate the plight of affected people; providing food, temporary shelter and emergency medical treatment. Teams were sent to the worst effected islands to assess the extent of the damage suffered. Some damaged houses and some retaining walls were quickly repaired.

While rehabilitation work was under way, the country was again subjected to big waves both in June and September, though the extent of the damage caused was less extensive. However, a number of cultivated fields were destroyed by the sea water sweeping over them, while some causeways between islands were also damaged. Two of the uninhabited islands were so badly affected that each of them was partitioned into two separate sections with a strip of sea water in between.

The recurrent nature of this most unusual phenomenon, the uncertainty of its cause and the damage created in the country has made it clear to the Government that preventive measures are essential in order to minimize the ill effects of such calamities in the future. The nature of these preventive measures is yet to be determined as a matter of policy. However, the threat of big waves is already a design factor in the proposing of new land reclamation schemes (currently not viewed favourably by Government) and in the design of harbour and sea wall constructions.

Media Images

The media locally, regionally and internationally have taken up the situation of the Maldives as an area of high risk. The events of the big waves plus scientific speculation concerning: the heating of the atmosphere through global pollution, talk of a sea level rise, plus talk of sinking of the submarine volcanic ridge under the coral, have been brought together to bring forth journalistic headlines such as "MALDIVES TO SINK BELOW THE WAVES INSIDE THIRTY YEARS."

Such announcements are being made prior to proven scientific investigation. They help to draw attention to the need for such investigation. They also, however, discourage investment
in the Maldives and cause a negative reaction in the minds of intending tourists.

Effects of delay in co-ordinating technical assessment

Following the big waves of April 1987 a number of overseas scientists and engineers made short visits to Maldives sites and made rapid assessments of damage in areas of their competence. Some identified the need for studies. Some said that assuming the damage inspected was due to certain specified design and technical problems then the solution would be found either 'as follows'; or from selecting from one among a number of presented alternatives.

These reports appear not to have been reviewed in any government committee from one unified perspective. Many reports overlap in their field of interests and in the action offered or recommended. For lack of a frame of reference government officers have found it difficult to process these reports and the consulting proposals. Government has been aware of this aspect of the problem and is keen to take steps to develop a unified field of review of disaster related problems and proposals. This unified view would bring items of environmental concern and of disaster management into one field of purview; which when developed would underpin separate but related policies and actions. Pending such co-ordination, action on many issues remains pending within government, and hence likewise in the international community; some of whose members have offered assistance but only providing a unified framework for action is devised.

Failure analysis of constructions

Direct observation (Oakley, 1988), plus a reading of technical reports of previous inspecting parties of big wave damage, reveals a certain pattern behind the construction failures:

1) They are either on, or close to, reclaimed land, or jut into the sea as protective devices for waterways and harbours, or are located between island causeways.

2) They are close to or on the edge of a reef and generally close to deep water: i.e. there is very little undersea coral shelf to dissipate waves.

3) The construction work is not engineered in a full understanding of the forces of the sea. For example, the protection of sea walls is insufficient, the height of the walls and piers are sometimes only some 3 feet above sea level.

4) Quality of construction that would be adequate for domestic construction inland is not sufficient for sea shore conditions: i.e. the choice and amount of mortar placed between large pieces of coral to make sea walls leaves many holes infilled. There is no grading of material from large to small fines: so no solidity.
This throws resistance to the sea upon the mortar finish skin coat. This, once broken, allows gouging surging waters into the holes and so the walls are destroyed from the inside.

5) Once water is through the wall it meets little resistance. The lightweight coral rocks are easily disposed of by the sea the unheld reclaimed landfill is washed out. This happens particularly quickly where the fill contains 50% rubbish from the town collecting points. (The use of such rubbish as fill without special construction precautions is dangerous.)

Because this analysis (which is subject to expansion and correction) has not been made some technical officers have assumed that, following the big wave phenomenon, land reclamation should not be practised. As a provisional policy position they may be right. As a policy for the mid-term they may have adopted too rigid a stance. If answers are found to the issues listed in 1 to 5 above then land reclamation can probably be continued.

The south seawall of Male'

This failed over most of its length under the impact of the April 1987 big wave attack. The reasons were probably a combination of the five featured in the earlier section plus the fact that the seas were being driven from a particular quarter which was critical for the wall.

Serious washout of the fill followed; and flooding of the fill and some surrounding areas. The western wall was also weakened and sections of the eastern wall of the reclaimed area were also broken.

The Government of Japan sent a survey team quickly after the April 1987 incident and this was followed by an offer to design, build and construct under a grant-in-aid a sea breakwater system along the south coastline ahead of the sea wall which would be realigned and rebuilt (to a new specification).

This generous offer has led to the construction of an ingenious and intellectually elegant breakwater series. This generosity, so ably fulfilled to a high technical quality using imported materials, management skills and construction organisation spanning four countries, sets a level of expectancy that will be difficult to repeat at other locations. It is as if the problem of a two mile walk to work had been solved by buying a Mercedes car.

The drinking water supply of Male'

While attention has been upon wave damage disaster is more silently and relentlessly creeping up upon Male' (and some other urbanised islands). Drinking water from the fresh water lens under the island in being used at a rate far in excess of
replenishment. There is a real danger that the lens will turn saline and be difficult to renew within the next four years or so. Government has been made alert to the danger. Road drainage is being improved so that the rainwater run-off can feed the lens. Government buildings and residential structures are being fitted with rainwater collectors. Storage tanks are being built, and two seawater distilling plants have been installed.

These actions may postpone the crisis but are not considered to have removed it. Meanwhile a sewerage scheme has been installed in the town and the standard of living - and so water use - is rising. This rise may prove more significant than sea level rise in making the Maldives uninhabitable at present levels of living and for the present sized population.

Natural environment management

This is critical to the successful prosecution of disaster preparedness and mitigation in the Maldives. There is a need to recognise and codify the problems. These relate basically to two areas of needed action:

a) The definition of the hazards in relation to the protection of the natural environment and particularly the shoreline.

b) Managing the environmental impact caused by the activities of man in the Maldives through:

i) industrial and commercial activity
ii) coral mining
iii) shoreline structures
iv) urban development
v) tourism
vi) other activities

Government is organising itself administratively to examine the issues.

Nature of the risks

Leaving aside here (but to be taken up later) all risks save big wave attack and sea level rise then strategies will need to:

a) prevent or strictly limit environmentally unwise developments
b) reduce losses through wave attack and flood of existing developments
c) reduce impact of flood risk perceptions on social life and economic activity
d) preserve natural environment when undertaking shore-line developments
e) reduce disturbance effects of shore-line structure and developments
f) manage the use of tourism in its impact on the natural environment
g) develop a co-ordinated programme for fresh water supply and storage (preliminary studies are now in progress).

h) protect and develop ground water recharge (studies in progress)

i) seriously promote the already announced policy of Selected Island Development (i.e. dispersal of urban population) in order to spread the social risks. (in progress)

j) consider limits on the use of chloro-fluoro carbons, for example as hair and beauty spray propellants.

**The overriding risk**

In order that any mitigation measures can be followed through, a design attitude has to be established toward the threat of sea rise. There is a need to establish, or to accept the views of others, as to what exactly are the physical dimensions, expected forces, and nature of forces that can be expected to be unleashed. In particular the risk of big driven waves riding on the top of already risen seas needs to be established.

These figures will be an outcome of consideration of: the 'green house effect', sea warming and rising, and the rate and degree of sea rises accompanying changes in climate and especially the increased risk from storms, also the influence of: possible atmospheric pressure drops, wind-stressed surge-driven waters, deep-water currents, and the height and shaping of breaking waves at the shoreline. Risks are likely to increase where high waters are driven between two islands located fairly close together. Water levels will rise even higher in this localized condition and place sea protection structures and causeways particularly at risk.

Marine scientists and environmentalists point to a progressive increase in risk over a period (say) fifty years. During which time (some speculate) and given no reduction in global use of atmospheric pollutants, the Maldives will be beneath the sea in forty years. The rate of growth of new coral reef, and the stimulating or retarding effects of warming water, remain unknown mitigation factors at present but are currently being studied by a Commonwealth group.

Oliver, John, 1988, 'Perspectives on Disaster Management in the Southwest Pacific', Newsletter No.3, November 1988.


David Oakley is an independent consultant with a wide experience in disaster preparedness, housing and building practice, and project management. He is also a member of the Panel.
SEA-LEVEL RISE: SOME IMPLICATIONS FOR TUVALU(1)

James Lewis

Tuvalu is one of six countries, all of them island states that "could face total destruction when sea levels rise........ If sea level rises occur anywhere near the extreme projections that have been made, we can write these nations off the map" (Pernetta, J C reported in the The Observer (Geoffrey Lean) 9 October 1988).

Sea-level Rise

Internationally accepted assumptions for increased temperatures are 1.5-4.5 degrees centigrade and for sea level rise are 20-140 centimetres before the end of the twenty-first century. Interim accepted assumptions are for 1.50 temperature rise and 20 centimetres sea-level rise by the year 2025 (UNEP, 1988).2.

Tuvalu Geography

Tuvalu comprises a chain of nine atoll islands in the South Pacific(3), all but two of which surrounded a lagoon. only one island encloses its lagoon entirely, the majority being made up of innumerable pieces of land (motu) surrounding their lagoon and each separate from the other. One other island has no lagoon but a swamp at its centre. Distances across each island lagoon are 15-18 kilometres and distances between each island are 125-150 kilometres. The entire atoll chain extends over 700 kilometres of ocean, but the total national land area is 25 square kilometres. The largest single island is 5 square kilometres; the highest point of all islands is 4.5 metres above mean sea level - most land areas are appreciably lower(4).

The population of Tuvalu is 8500, 2700 of whom live on the principle atoll of Fanafuti (Figure 1) at a density of 1150 per square kilometre - equal to that of Malta. National population density per square kilometre is 347, one third greater than that of the United Kingdom. A fragile economy, of which the only export income is from copra (A$35,000 in 1986), is stabilised by the Tuvalu Trust Fund(5), income from the sale of postage stamps, and remittances from Tuvaluans overseas. "Tuvalu's economy is small, fragmented and highly vulnerable to external influences": as is its economy, so is its topography and population.
Divergent views

If internationally accepted assumptions are correct, most of Tuvalu will be inundated by the end of the twenty-first century (Figure 2). As uncertainly will prevail for the greater part of one hundred years, two points of view will ensue. One will argue that with a sea already rising around fragile islands, continued investment in the development of a fragile existence now doomed, has no usefulness other than to reduce people to stay in an increasingly hazardous environment. There are many Tuvaluans who would agree and who see the urgent need for the easing of immigration restrictions in New Zealand and Australia—"where a few thousand more people would not be noticed".

The other will point to uncertainty itself and the one hundred years in which that uncertainty could be prolonged; to the realism of evacuation and Pacific precedents where many have preferred defiant and hazardous isolation to the unknowns of relocation; and to the experience by Tuvaluans of the sea and its hazards as a basis upon which to adjust over time. The imagery of possible ultimate catastrophe should not be made to preclude seemingly minor measures on behalf of the interim real condition.

The effects of a rising sea

The first effects of rising sea level will not be new to Tuvalu. Construction of the Funafuti airstrip by American Forces in World War II destroyed the "lens" of fresh water in the coral rock substrata; ancient pits filled with vegetal mulch for the growing of root crops (pulaka) in otherwise infertile coral sand were the first to show the effects of consequent salination that has been worsening since and which a rise in sea level will exacerbate. Efforts to introduce the growing of sweet potatoes, grown hydroponically in mounds of sand on ground level, will introduce alternative root crops—for time being less vulnerable to rising sea water salination.

Neither is sea water flooding a new phenomenon; at the twice yearly high tides of February and September, parts of densely populated Funafuti atoll are flooded to depths of up to 0.6 metre. Traditional house forms provided a floor level a metre off the ground—appropriate to land prone to flood. New "western" house styles introduced concrete floors at ground level and displaced outmoded traditional forms. New building codes are likely to reintroduce floors significantly raised above ground level.

These innovations in food production and house building are being taken with regard to indigenous and known hazards. Similarly, construction to prevent coastal erosion has been commenced—not on account of a rising sea but a normally aggressive one. Sea level rise will not present intermittent exacerbation of these known hazards—perhaps more frequently and perhaps more intensively but with periods of "normality" in between.
Hurricanes and vulnerability

Funafuti atoll was overwhelmed in 1972 by the fifty foot waves of Hurricane "Bebe" riding on an exceptional Spring tide and accompanied by winds of up to 150 knots (6). Nearly all of the 125 village houses were destroyed and government buildings were damaged beyond repair. Five people died and 700 were made homeless; crops were annihilated and copra production fell by 80% (7). An enormous ridge of coral reef rubble, 19 kilometres long and up to 4 metres high, appeared overnight on the ocean-facing coastline and enclosing a new inland lagoon (16). Similar banks appeared on other atolls.

Vulnerability to hazards of this and lesser kind require a people able to cope and an infrastructure able to support them. The condition of both before catastrophe is significant, as they enable survival and recovery afterwards. Provision of fresh rainwater for drinking and cooking; the removal of breeding places for mosquitos and other vectors; rubbish disposal and general attention to environmental health are all factors of quality of life that become crucial to survival and recovery after any kind of disaster. The incidence and intensity of disasters are likely to increase and these factors will become even more crucial. On Funafuti atoll, around Vaiku the capital and seat of Government, there presently exist conditions of overcrowding, environmental degradation and consequent environmental health hazards, comparable in their aggregation more to some urban peripheries of major cities than to tropical atoll islands.

An environmental strategy for development

A strategy for development (9) is required to accommodate a comprehensive approach to the implications of sea level rise in the atoll islands. Social and cultural aspects that will render vulnerable communities better able to adjust to their hazardous environments, as well as physical aspects of sea defences, must be considered. When there is a national policy for development to take account of the early implications of sea level rise, a balanced long-term strategy can effectively commence. Matters of long-term consequences would best be considered when short-term threats have been accommodated.

Sea defences

The land form of Funafuti atoll is so narrow and attenuated that in order to protect its 2.5 square kilometres, 54 kilometres of sea defences would have to be constructed. Moreover, so narrow is the land form for much of its length, that sea defences on one side would be protecting the back of sea defences on the other - with nothing in between. For sea defences to be feasible, the land form itself would have to be modified. Furthermore, because coral rock substrata is porous to depths beyond conventional sea defence construction, land forms so created would have to be raised within their defences so as not to be flooded from within due to porosity as sea levels rose - temporarily or permanently. What kind of
lifestyle would be possible in these "citadels of the sea" (Figure 3); and what kind of social, cultural and physical upheaval would be necessary for their construction and occupation are questions likely to displace those of economic evaluation. The enormity of the proposal reflects the enormity of the problem posed by sea level rise in its ultimate extreme.

Ultimate issues

Evacuation would be preferable to many Tuvaluans; but there are issues beyond those of any national consideration. Both international strategic and cultural issues are raised by the threatened disappearance of islands in vast expanses of ocean. Thus international assistance is vital for the conservation of both strategic and cultural values; but by encouraging and assisting cultural adaptation to indigenous hazards of the sea in the short and medium term, longer term strategic requirements may also be set.

Rather than dismissively "writing these nations off the map", field examination of their context, condition, and culture may lead to more creative assessments of their future - certainly for the short term and medium term and possibly for the more uncertain long-term as well.

Notes


2. United Nations Environment Programme (UNEP); Report of the Joint Meeting on Implications of Climate Changes, Split, October 1988. These assumptions were accepted at the UNEP/ICSU/WMO International Conference, Villach, October 1985 and incorporated into the work of the Commonwealth Expert Group.


4. Survey data do not exist for islands other than Fongafale motu of Funafuti atoll; Ordnance Survey maps being based on aerial photography.

5. The Tuvalu Trust Fund was created by Australia, New Zealand, the United Kingdom, Japan, the Republic of Korea and Tuvalu.


7. Funafuti population increased by about three times during reconstruction after Hurricane "Bebe" and in anticipation of national independence in 1978.

9. Tuvalu currently receives development assistance from Australia, New Zealand, the United Kingdom, the EEC, Canada, USA and the Federal Republic of Germany (Tuvalu: National Development Plan IV; 1988-91").

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*Figure 1: Tuvalu. Funafuti atoll.*
James Lewis is a consultant on hazards with a special interest in small islands. He is a Fellow in Development Studies at the University of Bath, and is also a Panel member.
RISE ING SEA-LEVELS AND CLIMATIC CHANGE:  
THE UK SCENE.  

D. I. Smith and Paul Thompson

The increasing media coverage given to global environmental issues and the greenhouse effect has drawn attention to the problems not only on a world wide scale and for small islands, but also for lowlying parts of the UK. This short paper briefly reviews current research taking place in the UK on these issues and some of the impacts which may be important in the UK and elsewhere. Research on climatic change impacts on agriculture are under represented in this paper, and we would welcome information on any other research or policy oriented programmes concerning risks and hazards associated with climatic change for inclusion in future Newsletters.

Research groups

1. University of East Anglia, Norwich NR4 7T5 (tel: 0603 56161). A wide range of research in both School of Environmental Science and the Climate Research Unit. These include climate and sea level change, their impacts and policy implications. The emphasis is upon the coasts of the UK. Head of Environmental Science: Professor K. Clayton; CRU, Professor T.M.L. Wigley.


3. Flood Hazard Research Centre, Middlesex Polytechnic, Queensway, Enfield, Middlesex, EN3 4SF, (tel: 01 368 1299). General reviews of sea level rise impacts for OECD, detailed research into methods for evaluation of coastal and flood protection projects and policies which can incompurate sea level rise. Head of Centre: Professor E. Penning-Rosell.

4. Geography Department, University of Durham. Projections of Sea level, and a GIS study of sea-level rise in northern England. Contact: Dr M.J. Tooley or Dr. I. Shennan.

5. The Ark Trust, 500 Harrow Road, London W9 3QA. A campaigning group - has produced dramatic maps showing implications of a sea level rise of 7.5 m (over 500 years away at current estimates of sea level rise) in UK. Also interesting summary papers on global warming and the Greenhouse effect.

Additional research is being undertaken by a range of government departments.
Sea-level rise in the UK

Future rates of sea level rise on the UK coast due to climatic change are currently estimated at 4-12mm/year, but the east coast is also falling relative to sea levels. The main risks are from increased frequency of flooding due to extreme events, particularly storm surges, but the risks have not been evaluated in detail yet. The Thames Barrier is an example of a project which assumed a relative sea level rise of 5mm/year (but not from climatic change) - in future it is likely that more coastal works will make this type of assumption. However, there is a lack of coordinated and integrated planning for the UK coastal zone. This will be necessary to avoid potentially wasteful expenditure on expensive protection works which may encourage urban development at risk of severe flooding and make continually improving protection work necessary.

Coastal developments and protection projects in the UK and elsewhere often have lives of 50 or more years. Hence it is important that the implications of climatic change are taken into account now in decisions so that future options are open in the face of these major uncertainties.

Examples of publications of interest by groups mentioned:

ARK 1989. After the flood; the Ark map of the united Kingdom in the year 2050. London: Ark Trust.


D. I. (Dingle) Smith is a senior Fellow at the Centre for Resource and Environmental Studies, Australian National University; and currently visiting Fellow at the Flood Hazard Research Centre, Middlesex Polytechnic.
Paul Thompson is a Researcher at the Flood Hazard Research Centre, Middlesex Polytechnic.
Visit to Centre for Water Resources Studies, University of Patna, Patna 80000, India.

Edmund Penning-Rowsell, Flood Hazard Research Centre, Middlesex Polytechnic.

This 10 day visit was designed to promote collaboration between the Middlesex Polytechnic Flood Hazard Research Centre and this growing water resources research and development centre at the University of Patna. The Centre there has a decade of experience in running short courses, Workshops and International Seminars, mainly on the theme of water resources and economic development. The Centre is headed by Dr T. Prasad, an experienced engineer with specialist skills in the hydrology and hydraulics fields. With the broadening of the scope of our Flood Hazard Research Centre into other water resources fields such as pollution abatement and water resource institutions and charging systems, a visit was considered a useful first step in a possible programme of collaboration.

The Centre for Water Resources Studies at Patna has some 22 staff of whom six are Associates of the Centre and hold teaching posts in the University, mainly in the Department of Civil Engineering. The full-time researchers are the Director, T. Prasad (engineer) G. Guptu (economist), A. Verdun (hydrologist) and an agricultural engineer. Specialist Associates include those in hydraulics and structural engineering, and the Centre has recently appointed A. Sinha, formerly of the Central Water Commission, to be the Visiting Professor.

The Centre is just completing a project for the Ford Foundation on the potential for increasing irrigation for agricultural intensification in Bihar. The next programme of research, just started, is a project for the Central Board for Irrigation and Power on the possible flood alleviation strategies for North Bihar which, as one of the most flood-prone regions of the world, is one of India's most economically backward areas. The visit was used to develop a case study based methodology for appraising priorities for flood alleviation strategies, with an emphasis on developing warning systems and other low-cost approaches.

A visit to Delhi on the return journey allowed consultation with the Ford Foundation to indicate that their grants for projects and a new building for the Centre were being well used. In addition contacts were made with the British Council with a view to them supporting a continuing programme of research collaboration between our two Centres. Altogether I obtained a most favourable impression of the Patna Centre for Water Resources Studies and I am sure that Dr T. Prasad would be very happy to welcome other Panel members and correspondents to Patna.
Disaster Management Studies Centre

A new era has commenced for the Australia counter-disaster community with the establishment of a Disaster Management Studies Centre (DMSC) at Cumberland College of Health Sciences, located at Lidcombe, in Sydney (Australia). The decision to establish a disaster research and teaching centre was announced formally by Cumberland College in February. There has been a gap in the current national capability to study and undertake research into disasters. This has been brought about, in part, because of the absence of any vocational demand for scholars to invest the time and effort needed to become skillful; in this field of endeavour. The same could be said about the practical side of disaster management. Thus, there has been a gap in existing emergency service training programme has been available for disaster services personnel. Equally important, there has been no geographical focus for disaster research and teaching within Australia and the wider Pacific/Asian regions. It is expected that, with the development of a specialist Disaster Management Studies Centre at Cumberland College, these gaps will be narrowed, and the proficiency of both national and regional disaster management will be enhanced. In turn, this will increase the demand for disaster researchers and for formally qualified counter-disaster professionals.

The role expected of DMSC can be ascertained by describing the major objectives of the Centre. These are to:

1. Promote disaster research and teaching in the Southern Hemisphere and in particular generate greater awareness of the necessity for disaster management and emergency health management;
2. Develop or adapt curricula relating to disaster management and emergency health management, and to prepare training materials and aids for the various categories of personnel needed for emergency preparedness and response;
3. Provide expert advice on matters relating to disaster and emergency health management;
4. Conduct relevant studies throughout Australia, the western Pacific and other regions;
5. Collaborate with existing educational and health care agencies to facilitate the development of expertise in disaster management;
6. Collect and disseminate information concerning disaster management; and
7. Liaise with other relevant experts and institutions, governmental and professional agencies involved in disaster and health emergency problems, and to promote the development of disaster management throughout the regions.

Cumberland College is well-placed to carry out these important areas of activity. The appropriateness of the College to provide the location and resources in the light of its major involvement in the disaster field has been acclaimed by members of the Australian disaster research community and by senior counter-disaster managers. The unique profile of the
college as a tertiary educational institution in research, teaching, and training of the health and allied sciences is internationally recognized. The development of DMSC is a natural extension of current College teaching and research programmes. Cumberland College already offers components on disaster management in undergraduate courses, and a postgraduate option is available at Masters level. These activities will be strengthened with the introduction of a Diploma in Disaster Management course which commences in 1990 (see below), and when Masters research and Doctoral study programmes are offered in the near future. Academic staff have been involved in hazard impact field-work, and disaster-specific research is presented and published by staff in national and international forums. Health consultancy work and advisory commissions, including assignments of a disaster-specific nature, are regularly undertaken by staff throughout Australia, Asia and the Pacific. In addition, the co-editorship of a leading disaster research publication, The International Journal of Mass Emergency and Disasters, currently resides at Cumberland College.

The objectives outlined above can be summarised in the following five fields of activities which DMSC will pursue:

1. Research: in all phases of the disaster spectrum by means of general theory development, on-site impact investigations and long-term research projects;
2. Teaching: providing emergency and disaster personnel with a recognised tertiary qualification (a Diploma in Disaster Management);
3. Training: directed towards in-country training programmes throughout the South West Pacific, South and South East Asia regions in accordance with the World Health Organisation's Emergency Preparedness and Response Programme;
4. Information Clearing House: focussing on both disaster and emergency health management in the Southern Hemisphere; and
5. Consultant work: to provide expert advise on disaster management to government organisations, emergency services, voluntary and professional agencies, and local communities.

Commencing DMSC will be offering a Diploma in Disaster Management. The content of the Diploma is oriented towards developing a comprehensive understanding of the phenomena of disaster and the management of disaster impact. The programme is designed to develop professional skills in disaster management. It will focus on providing students with knowledge and intellectual skills that will enhance the effective delivery of inter-agency emergency and disaster services. The programme will not focus on operational skills training. The diploma course is designed to expand and contextualize those skills training and knowledge previously acquired by emergency services personnel. The programme will be of interest to those in State/Territory Emergency Services, Police, Fire and Ambulance services, Social and Welfare services, and in the Health services. Thus the Diploma will augment the courses already available through the Australian
Counter College and the initial recruitment education programmes and senior management courses (both of which cover aspects of disaster) available to state and Territory police, fire and ambulance services.

DMSC and its inter-disciplinary programme will be located within the Department of Behavioural Sciences. The course will provide students with a series of 'core subjects together with a choice of 'electives'. One elective will be based on disaster management in the context of 'developed nations' and will be based, as far as possible, on the Australian context. Another elective will be oriented towards disaster management 'developing nations' and is designed to assist emergency and disaster personnel in Pacific and Asian regions. Further course electives, such as programme in emergency health management, are expected to follow.

The DMSC proposal contains provision for a budget with full-time academic and support staff, DMSC will employ the specialist skills of Cumberland College academics. Particularly in the first few years, staff will also be argued by inviting external disaster researchers and practitioners to participate in the Centre's teaching programmes. The opportunity will also exist for scholars outside of DMSC to participate in the Centre's research programmes or to undertake separate projects under the auspices of the Centre.

For further information relating to the Disaster Management Studies Centre or its activities, please contact the Director, Dr Neil Britton at:

Disaster Management Studies Centre
Cumberland College of Health Sciences
East Street
P O Box 170
Lidcome
Sydney NSW 2141

Natural Hazards Project

The Natural Hazards Project (NHP) is a technical assistance project of the Organisation of American States, Department of Regional Development, supported by funding from the Office of Foreign Disaster Assistance (OFDA) of the United States Agency for International Development, and based at the OAS headquarters in Washington, D.C. It began in 1983 as a pilot project in natural hazards risk assessment and disaster mitigation in Latin America and the Caribbean Basin, with activities in Honduras, Paraguay and in Saint Lucia, and it has since expanded its scope to include activities in 17 countries in the Caribbean, Central and South America.

The basic aim of the project is to avoid or reduce potential disasters through intervention in the development planning and project formulation processes. Specifically, the project focuses on:
a. Assessing natural hazards risk as part of ongoing natural resource evaluations and development strategy formulations;
b. Identifying and formulating mitigation measures for development investment projects;
c. Making information on natural hazard risks more accessible to development planners;
d. Training planning technicians and decision-makers in risk assessment and disaster mitigation techniques.

Activities of the Natural Hazards Project are generally carried out as part of ongoing technical assistance projects of the Department of Regional Development at a national or regional level with OAS member States. Additional activities are executed in collaboration with national or regional institutions. A summary of these activities follows:

**In the Caribbean**

1. **Landslide hazard assessment and training:**
   - Dominica, Saint Lucia, Saint Vincent and the Grenadines.
   - Training workshops in landslide hazard assessment methods and map production in Jamaica: with participants from five Caribbean countries.

2. **Settlement and lifetime hazard assessment and training:**
   - Saint Lucia, St. Kitts and Nevis, Grenada.
   - Training workshop in hazard risk assessments for small towns and villages, held in Saint Lucia with participants from five Caribbean countries.

3. **Installation of the Emergency Information System (EIS) and training:**
   - Office of Disaster Preparedness, Jamaica

4. **Natural hazards assessment and regional development:**
   - Frontier regions of Haiti and the Dominican Republic.

**In Central America**

1. **Natural hazards assessment and regional development:**
   - Trifinio Project area (El Salvador, Guatemala, and Honduras)
   - Tegucigalpa metropolitan area, Honduras Atlántida and Isla de la Bahía, Honduras

2. **Introduction of geographic information systems (GIS) for analysis of natural resource, population, infrastructure, and natural hazards information:**
   - Ministry of Natural Resources, Energy and Mines, Costa Rica
   - Secretariat for Planning, Honduras

3. **Installation of the Emergency Information System (EIS) and training:**
   - Secretariat for Planning and National Emergency Commission, Honduras
4. Course on the Use of Natural Hazards Information in Investment Project Formulation:
   - Central American Institute for Public Administration (ICAP), Costa Rica, with participants from six Central American countries.

In South America

1. Natural hazards assessment and regional development:
   - San Miguel y Putumayo River valleys, Columbia and Ecuador
   - Chaco region, Paraguay

2. Flood hazard assessment:
   - Mamore River Valley, Bolivia
   - Parapeti River Valley, Bolivia
   - Chaco region, Paraguay

3. Desertification Hazard Assessment:
   - San Fransisco River Valley, Brazil
   - Chaco region, Paraguay

4. Seismic Vulnerability and Retrofitting of Buildings:
   - Merida, Venezuela

5. Course on the use of Natural Hazards Information Investment Project Formulation:
   - Inter-American Institute for the Integral Development of land and Water (CIDIAT), Venezuela: two pilot courses with the participation of 42 professionals from eighteen different countries.

6. Workshop on natural hazards assessment and integrated development planning:
   - National Forestry Corporation (CONAF), Chile

In addition, the Natural Hazards Project is an active participant in diverse international forums on natural hazards management. Staff of the NHP regularly participate and present papers in workshops, discussion groups, and conferences on natural hazard management issues.

Contacts:

Stephen O Bender, Project Cheif
Jan C Vermeiren, Caribbean Development Coordinator

Natural Hazards Project
OAS - Department of Regional Development
1889 F Street, N.W.
Washington, D.C.

Tel: (202) 458-3005
Telex: 64128
Fax: (202) 458-3967
Disaster Management Centre, Oxford

1988 was a very busy year for us with research activity, training courses, both abroad and in Oxford, the development at outline stage of a database, the continual need to provide information to various sources, media, students, agencies etc, and the overall establishment of the Disaster Management Centre within Oxford Polytechnic.

1. Workshops and Training in Disaster Management

In March 1988 Ian had the pleasure of working with Everett Ressler and Brian Ward of the Disaster Management Centre in the Asian Institute of Technology, Bangkok and with Moira Hart, Emergency Director of UNICEF, in jointly leading the Disaster Management course held in the Philippines. This was an exciting two weeks spent in the Government Development Academy which is perched on the edge of the Volcanic Lake Tall. We are hopeful that this workshop will become institutionalised and take place on a regular basis but are still waiting to hear of progress in this direction.

In January, Ian was in Salvador meeting with the Relief Consortium made up of various Protestant churches who have implemented a massive reconstruction programme following the earthquake of 1986. From this meeting a workshop has been planned to take place in Guatemala for these church groups. This will probably happen in February/March 1989. We have contributed to a health administrators course on disaster planning in Brussels in June and the first Disaster Management course in Ankara during November.

An innovation in 1988 was to collaborate with four groups in the running of our workshop programme. Ernst Lohman from Infraplan in Holland led a week on Hazard Mapping and Community Involvement; Dennis Parker and Edmund Penning-Rawse from the Flood Hazard Research Centre, Middlesex Polytechnic ran a module on Flood Management in Great Britain; Professor Nicholas Ambreyseys from Imperial College took the group through a crash course on earthquake planning, and finally Andy Coburn and Robin Spence from the Martin Centre, University of Cambridge did a course on Risk Modelling in seismic areas.

The Oxford workshops identified the need for targeting our progress very sharply at specific groups with an even tighter definition of the range of hazards to be covered, hence the new outline for the courses in 1989.

Dr Wu Qingzhou from South China Technical Institute has spent a full year with us looking at flood problems, attending our workshops and recently making a tour of British towns as part of his work on architectural history. Dr Wu did his PhD on the protection of ancient Chinese cities from flood impact and will be delighted to hear from anyone who might like to correspond with him, at the following address: Department of Architecture, South China Institute of Technology (SCIT), Guangzhou, Guangdong, People's Republic of China.
One of the target groups we identified in need of training was that of high level government advisors at Under Secretary Administrative levels. Therefore discussions have been held with British Council to see whether we can produce a specific course aimed at these senior level government personnel. We are thinking of the possibility of September 1990 when British Council would run the course for the first year with our Centre providing technical input.

2. Research Projects

During the past year Ian has been completing his part in the UNDRO Disaster Mitigation Guidelines project which has been funded by the Government of Netherlands. This is reaching completion and publication by UNDRO is likely within the coming year.

Since January 1988 we have been working closely with the University of Cambridge in a joint project which is concerned with the reduction of seismic vulnerability in Mexico City co-ordinated by Yasemin Aysan. We are trying, possibly for the first time, to develop a way to measure the vulnerability of occupants of buildings to earthquakes. If this can be achieved the information gathered can be fed into government projections of likely damage in future earthquakes which will then in turn provide information on which to base their mitigation preparedness programmes. Part of the Mexican project involves training and three of their officials joined us during our 1988 summer workshop programme.

3. Development of database on disaster management

One of our main targets for the current phase of development is to develop a disasters database. Our aim is to publish a journal of abstracts which relate to documents we receive on the following subjects.

Disasters and Building/Physical Planning:

Emergency shelter - evacuation, planning - reconstruction, planning - hazard resistant buildings - lifelines (Infrastructure - services - damage surveys - retrofit).

Disaster Management:


Hazard Types:

Earthquake - floods - high winds - landslide (lesser focus on wars - technological hazards - refugee situations).
Case Studies

Third World emphasis, earthquakes, flood, high winds, historical data.

Our intention is to issue a three monthly digest of material received and we are currently drafting a funding application to finance this operation. If you are interested in receiving a sample digest we will be happy to hear from you and will send details of costings etc.

Part of the objective of this database is to work more closely with Disaster Management Centres in other countries such as Ankara, Managua, Jakarta and Bangkok to develop a form of networking of useful data and to do this we hope to use compatible computer software.

4. Future workshops and conferences

In addition to the Oxford Workshops we are working on a forthcoming conference which links to the International Decade for Natural Disaster Reduction with the National Center for Earthquake Engineering Research; the Martin Centre, University of Cambridge; and Virginia Polytechnic Institute. The conference has been proposed for the spring of 1989 in Buffalo with the above groups as the sponsoring bodies. Details of this conference may be obtained from Ms Jelena Pantelic, National Center for Earthquake Engineering Research, SUNY at Buffalo, Red Jacket Quadrangle, New York 14261, USA.

We are sorry that our proposed conference for September 1988 on 'Disasters and the Small Dwelling: A review of Ten Years Progress' had to be cancelled due to lack of funding support. We had hoped that the forthcoming conference noted above in Buffalo would have been able to pick up that particular topic but as it has transpired, for a variety of reasons, this meeting will have a wider context than that of the low-income small dwelling. Therefore we are still hopeful to sponsor the meeting on the small dwelling subject.

Ian Davis
Disaster Management Centre
Oxford Polytechnic
Headington
Oxford OX3 0BP
Tel: (0865) 819210

PUBLICATIONS RECEIVED

Drought Network News

Drought is a natural hazard that is most difficult to define in terms of extent or severity. It can be argued however, that for human well-being and economic loss that it is the worst hazard of all. The Ethiopian and Sahel droughts receive frequent coverage but information on the status of droughts elsewhere or accounts of research into physical, socio-
economic aspects and policy is poorly reported. It is therefore, a delight to announce the publication of Drought Network News, a newsletter produced by the International Drought Information Center housed within the Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

The DNN is a 24-page publication, to be published three times a year and funded for three years by the World Climate Program of the WMO. The first number appeared in January 1989 and the second in May. The newsletter is available free by writing to:

Jan Schinstock
Center for Agricultural Meteorology and Climatology
236 L.W. Chase Hall
University of Nebraska-Lincoln
LINCOLN NE 68583-0728
USA

The editor, Don Wilhite, and his staff are to be congratulated on the uniformly high standard of the contributions and the technical production. Already DNN has demonstrated its breadth both in terms of geographical coverage and in the range of contents. The first number contained accounts of the 1988 north American drought and the second has several articles from Australia. The September issue will focus on south America, Africa and India. The contents of DNN include contributions ranging from climatology to national drought policy. Most of the information concerns current drought prospects from many parts of the world. For instance, a review from Hungary presents a national map of soil moisture for April 1989! In addition to the articles and reports there is valuable information on forthcoming workshops and seminars. In short, an excellent publication which clearly fills an important niche in the hazard information field.

Seismic Isolation

This Newsletter is produced by Dynamic Isolation Systems Inc of 2855 Telegraph Avenue Suite 410, Bedith, CA 94705 and started up in 1987. The Newsletter is concerned with high-teech earthquake resistance for buildings and reports on latest developments in the technology.


In five conventional parts devoted to earthquakes and subsidence, mountain hazards, hazards of climate, and preparedness and rescue, twenty-four brief chapters were mostly papers prepared for publication in UNESCO's Impact of Science on Society (Vol 32 No 2) of which Robert Maybury was Editor before his retirement from UNESCO in 1983. Other chapters are "timely reprints" from Chemical Engineering News, Nature and Resources, UNDRO News and Christian Science Monitor.
James Lewis wrote that 'this book is probably a successful popularisation of natural hazards science. That however, was not its objective; it sought to bring together two groups - scientists struggling to unveil the secrets of nature's violence and public spirited individuals' dedicated to the need for public co-operation and effective action. Why therefore are only a third of the chapters devoted to 'preparedness and rescue', identified (publisher's note) as more important than prediction (Kitazawa) in reducing 'the devastating effects of the earth's cataclysmic events'? But what of the third group of participants - the Third World itself, rendered so vulnerable by lack of options and choices without which 'knowledge' and 'public education' have no strategic usefulness. Michael Fournier d'Albe and Ludovic van Essche discuss UNDRRO's version of built vulnerability, but the greater proportions of disaster prone populations occupy buildings untouched by science, engineering or planning.

Conditions in developing countries, incumbent of highest numbers and proportions of disaster losses, receive only passing mention (Ebert). Even when this book was conceived, there was ample literature on the vulnerability process from which to draw this essential third component.

Much of this book's material dates from the late 1970's or early 1980's. In spite of its claim to have taken 'one step further', there is little to advance the integration of science with public administration and development towards the reduction of vulnerability to natural hazards as they continue their catastrophic topicality into the 1990's.'

FORTHCOMING EVENTS

12 - 13 September, 1989. Disaster Prevention Conference. University of Bradford, Disaster Prevention and Limitation Unit (DPLU). Focus is on Britain and European Community. Contact: The Conference Organiser, DPLU, Department of Industrial Technology, University of Bradford, Bradford, West Yorkshire, BD7 1DP.


Details from:

Renee Prendergast,
Department of Economics
The Queen's University of Belfast
BELFAST BT7 1NN
Northern Ireland
24 - 25 October 1989, International Hazards Panel Annual Workshop at Oxford Polytechnic. Theme: The role of Non Governmental Agency in Disaster Mitigation. Andrew Maskrey, currently directing ITDG's work in Lima, Peru, has extensive experience of community based mitigation and has written a book on the subject to be published by OXFAM to coincide with this meeting. Andrew will also provide the keynote address to the meeting.

Aims:

- to examine the constraints and opportunities that face NGO's in this type of development work.
- to see how mitigation planning relates to broad development work.
- to examine specific examples of community based mitigation against a variety of hazard types:
  - ie earthquake
  - flood
  - drought
  - hurricanes

As a contribution to the forthcoming Decade on Disaster Reduction the workshop will attempt to develop an AGENDA for non-governmental agencies in mitigation planning. This will be widely disseminated to the United Nations/Governments and via the federations of voluntary agencies.

Details of arrangements are available from:

Ian Davies
Chair
Disaster Management Centre
Oxford Polytechnic,
Headington
Oxford
Tel 0865 819210
Fax 0865 819073
819455

24 - 26 October 1989 International meeting on Catastrophes & Society in Madrid, Spain organised by MAPFRE a foundation aimed at promoting safety in its widest sense.

Aims:

- analyse social and economic problems of natural disasters
- promote systems for preventing these disasters
- improve relations between public and private institutions
- increase awareness of issues
- improve links in disaster preparation and preparedness between industrialised and third world counties
In Spanish, French and English. Contact:

ITSEMAP
Secretaria del Encmento
CATASTROFES Y SOCIGDAD
Paseo de Recoletos, 25
28004 Madrid
Spain
Telex 48902 MAPFRF

7 February 1990. **BCB Conference on Disaster Relief and Mitigation.** The British Consultants Bureau is organising a conference at the Queen Elizabeth II Conference Centre at the commencement of the United Nations International Decade for Natural Disaster Reduction.

"This conference is a unique opportunity to bring together all involved with the disaster cycle, and demonstrate how consultants' expertise can be used most effectively both nationally and internationally."

**Speakers who have been invited include:**

HRH The Duke of Gloucester

The UN Disaster Relief Office

The UK Minister for Overseas Development: Mr. Christopher Patten

The World Bank: Dr Alcira Kreimer

**Enquiries:** Major-General Tony Boam, CB CBE
Director - British Consultants Bureau
1 Westminster Palace Gardens
1-7 Artillery Row
London. SW1P 1RJ

**Telephone:** 01-222 3651 **Fax:** 01-222 3664

1990 - 1999 **United Nations International Decade for Natural Disaster Reduction** is due to commence shortly. News of international agency, and national government and NGO responses to this initiative and of events associated with IDNDR is invited for inclusion in the next Newsletter.
Panel membership is from the following countries:

Argentina
Australia
Belgium
Bukina Faso
Colombia
Dominican Republic
Ecuador
Ethiopia
France
Guatemala
Honduras
India
Indonesia
Israel
Italy
Jamaica
Libya
Mexico
Netherlands
New Guinea
New Zealand
Niger
Pakistan
Peru
Philippines
Sudan
Switzerland
Tanzania
Thailand
Uganda
United Kingdom
United States of America
Venezuela