It also recommended that planning for malaria control in the next season begin immediately.

The group recognised the management of potable water and sanitation were difficult issues and more public health measures were needed to overcome deficiencies. In particular, urgent attention needed to be paid to water quality. A study of bacteria and parasites was needed in flood-affected areas.

The existing system to identify disaster victims and the analysis of the cause of sudden and unexpected death appeared deficient. A better system was seen as an important step in primary prevention strategies for public health in disasters, in particular epidemics.

After identifying the above issues and making its recommendations, the team conducted a bilingual training program in disaster management for 30 public health professionals. Presentations were delivered in English supported by slides and notes in Portugese. Participants identified water and sanitation, together with rural access, as the key recovery issues in an emergency.

The training program ended with the development of outlines for a flood response disaster plan and a public health disaster management plan. The course was well received, as it was the first such training opportunity in disaster management for health.

At the end of the mission, the team delivered a formal briefing to a range of senior Mozambican officials outlining recommendations for the development of a National Disaster Management System and highlighting the importance of work to prevent emergencies the scale of the 2000 floods.

Volcano monitoring in Papua New Guinea

Papua New Guinea has many active volcanoes. Fourteen have erupted over the past 200 years.

In September 1994, Tavurvur and Vulcan volcanoes erupted, inflicting enormous damage on the northeastern part of the Gazelle Peninsula, including Rabaul town. The devastation badly affected the basic socio-economic infrastructure system in Rabaul Township and the surrounding villages and left a damage bill in the order of K280 million.

The eruption exposed weaknesses in the National Volcanological Service and consequently the ability of the PNG Government to provide an effective warning service for the community.

The first weakness was the monitoring equipment used throughout the country by the Rabaul Volcanological Observatory. It had deteriorated because of ageing exaggerated by the tropical environment.

The second was that the Observatory was not able to collect and analyse large amounts of data quickly.

The Australian Government agreed to assist the Government of Papua New Guinea in the form of a $6.5 million project to upgrade and strengthen the National Volcanological Service to try to reduce the impact of active volcanoes on PNG communities. The project had two phases, starting in 1995 and largely ending by June 2000.

During the first phase, the Australian Geological Survey Organisation procured new monitoring equipment for the

Rabaul Volcanological Observatory. The second phase was specifically designed as the outcome of a needs analysis carried out by an AusAID sponsored mission just after the Rabaul eruption. The mission recommended an urgent programme of support be provided to the observatory which was unable to efficiently monitor the behaviour of the volcanoes and provide timely reports of events because of a lack of maintenance, equipment and staff.

To overcome these deficiencies the project responded in four ways.

It helped design and provide volcano monitoring recording equipment and sent specialist advisers to help with installation. It conducted training and established a geochemical monitoring facility.

Staff at the Rabaul Volcanological Observatory were given extra training in the analysis of information relating to volcanoes. A major geophysical survey was done of the deep interior of Rabaul volcano and dating of selected Rabaul rocks was undertaken to determine more precisely the eruptive history of the volcano.

Hardware and software were provided to the observatory so it could operate a Volcanic-hazard Mapping and Information System. The system is used for mapping and assessing areas of risk and in the production of hazard maps. Relevant datasets and training gave staff the ability to operate the system effectively.

The observatory was also given a general package of support in the form of a new four-wheel drive vehicle, internet connection, an improved telephone system and the production of a public-awareness video highlighting the dangers of active volcanoes.

New radio antennae were erected at the five high-risk volcanoes following negotiations with local landowners or custodians over access to land.

There have been no identifiable environmental effects from the antennae.

Additional work has since been done to ensure specific elements of the project can be sustained. These include providing extra training to technical staff, establishing a remote centre at the headquarters of the Australian Geographical Survey Organisation, providing the Rabaul Volcanological Observatory with a comprehensive set of spare parts and components and a technician to install a remote site at Pago.

The extended project is scheduled to end at the end of 2002 at a cost of $435,000.

Disaster Management in the Pacific

The Pacific is one of the most disaster prone areas in the world. Cyclones, droughts, active volcanoes, severe earthquakes, oil pollution, urban fires, aircraft disasters, tsunamis, coastal erosion, global warming, rising sea levels, El Nino and La Nina, armed conflict, civil disturbances, exotic animal and plant diseases and major health emergencies all afflict the region's small island states.

In the early 1990s tropical cyclone Ofa descended on Samoa, causing damage exceeding US$100 million and in Fiji cyclone Kina left the government with a damage bill estimated at over US$120 million. 1997 brought a drought to Papua New Guinea that saw streams, creeks and swamps dry up, rivers disappear, schools close, and major power cuts as lack of water reduced power-generating capacity. One assessment found 777,000 people facing famine. In the same country in 1998, a tsunami of up to 10 metres in height wiped out several villages and killed more than 2,000 people near Aitape.

The scale of lives and property lost to disaster in the Pacific is devastating, but even these statistics do not fully reflect the impact of disasters on the people of the Pacific. Though there is a great diversity of culture and conditions in the Pacific islands, all rely heavily on the exploitation of their natural resources for economic support. Forestry, fisheries, agriculture and tourism are the main industries, with differences of scale from subsistence to large commercial plantations. Each of these industries, and by extension the economy in general, are highly sensitive to their environment and to the weather. A disaster, such as a drought, impacts strongly not just on certain sectors of the community, but on everyone.

While reports by the United Nations Development Program have shown an increase in living standards in many Pacific countries, development is a fragile process. On top of direct economic losses, each time a disaster hits, scarce funds that could have been used for providing better education, health care or improvements in businesses and services must be diverted into disaster relief and rebuilding.

Costs are often extensive. Addressing the losses felt during Fiji's cyclone Kina used up almost 40 per cent of Fiji's capital budget. A United Nations task force stressed that unless preventive measures were taken, future disasters would account for a significant proportion of GDP. Rebuilding often suspends the development process and the frequency of disasters in the Pacific leaves little time to rebuild reserves and capacity to cope before the next one hits. A descending spiral of increased poverty and vulnerability is a serious threat.

In the past, these disasters were seen as overwhelming and unavoidable, as 'Acts of God'. Gradually this attitude is changing as the capacity to manage events and reduce vulnerability has

improved. Specific units within government agencies have taken on responsibility for disaster management activities and some resources have been set aside for mitigation.

Pacific Islands are beginning to recognise though that this issue requires more than the attention of a small part of a single agency. Disasters are a national priority and coordination of planning and resources is needed across government. Appreciation is also growing that the development of response capability is important, but so is preparedness, mitigation and recovery.

To this end, 15 countries are working together with the South Pacific Applied Geoscience Commission, known as SOPAC, on a program that takes a new approach to disaster management in the Pacific.

SOPAC is based in Fiji and is a regional organisation that provides technical advice, training and research assistance to member countries. It is divided into units that focus on mineral, water, and energy resource management, hazard assessment and coastal monitoring. Members include Cook Islands, Federated States of Micronesia, Fiji, Guam, Kiribati, Marshall Islands, New Zealand, Niue, Papua New Guinea, Samoa, Solomon Islands, Kingdom of Tonga, Tuvalu and Vanuatu, and Australia, which provided SOPAC with $1.3 million in funding in 2000–01. (French Polynesia and New Caledonia are Associate Members.)

Since its commencement in July 2000, the Disaster Management Unit at SOPAC, with funding from AusAID and the New Zealand Government, has undertaken an ambitious new program which emphasizes preparedness, mitigation and a comprehensive, integrated risk management approach. The unit works at several levels in the community. Training is provided to key disaster management personnel within each country to assist them to design, maintain and evaluate disaster management plans. The intention is that these officers not merely implement plans adopted from larger countries. Each will become skilled in creating their own plans and adapting existing methods to the particular needs of their countries.

Disaster plans will not relate only to a single agency, but incorporate negotiation and coordination with a range of stakeholders. To support this more extensive process, the Disaster Management Unit has established the CHARM model (Comprehensive Hazard and Risk Management) that provides guidelines for an integrated national planning process. Though based on the Australia/New Zealand Risk Management Standard, CHARM is being developed to reflect the unique needs and conditions of the Pacific Islands.

Considerable effort is also going into building networks between National Disaster Management Offices in different Pacific Island countries and counterpart agencies in Australia and New Zealand. This will allow information and expertise to be shared and development of a fuller understanding of regional hazards.

The Disaster Management Unit program also works with non-government organisations, the private sector and the broader government to build an appreciation of the importance and potential benefits of risk management, in the context of disaster management, as a basic approach underlying the core functions of many agencies.

Conclusion

The above country examples are just some of the ways in which the Australian Government, through AusAID, has responded to natural and humanitarian crises around the world. The Government believes it has not only a moral obligation to assist in times of crises but a responsibility to do so for sound social, economic and security reasons.

Through its aid program, AusAID is assisting vulnerable countries to become better prepared for crises. In partnership with these countries, it is giving local people increased confidence and knowledge to put in place measures to reduce the impact of damaging natural events. It is helping build a level of resilience to deal with the financial, social and emotional effects of disasters.

More than ever the aid program is also attempting to reduce vulnerability by supporting activities and approaches that minimise the possibility of conflicts and are responsive both during and after conflicts to restoring the basis for development. This has been clearly evident in AusAID's approach to East Timor where emergency relief has quickly been replaced by long-term sustainable projects.

The Australian Government's aid program does not profess to have all the answers. However it does have the will and the experience to make a substantial contribution to the alleviation of suffering brought about by natural and man-made disasters in developing countries, particularly in the Asia-Pacific region.

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