

10. Disaster insurance

Insurance is not an economic solution to potential disaster losses but simply a mechanism for the transfer of risk, effectively altering the economic impacts of a disaster but not necessarily reducing them. In countries which rely heavily on the world reinsurance market, insurance also implies a substantial constant leakage. This has potential implications for domestic rates of growth and levels of investment, although it has not been a problem in Fiji to date, where domestic savings have exceeded private sector investment requirements. However, insurance helps facilitate the recovery of individual producers and may encourage investment in enterprises where the risks would otherwise have been too great. Extensive use of the reinsurance market also offers an important means of reducing the cost of reconstruction activities born by the domestic economy. Moreover, in a small open economy such as Fiji's, it can play an important role in preventing a deterioration in the balance of payments, as already indicated (see Chapter 5). The insurance industry can also be used to promote the adoption of disaster mitigation measures, particularly improved building standards. Indeed, Fiji is widely quoted as an important success case in this regard (see Box 10.1). On balance, it is therefore important to encourage the uptake of insurance policies whilst also ensuring that the country does not become unattractive in the eyes of reinsurers.

There are currently six licensed non-life insurers in Fiji, one of which has domestic shareholders, and six insurance brokers. However, the number of insurance companies has fluctuated substantially, reflecting both the impacts of disasters and changes in perceived risk. Following Cyclone Oscar and large associated insurance claims in 1983, the domestic insurance industry sought a 400% increase in property premiums. However, this rise was blocked by the Reserve Bank of Fiji and the Insurance Commissioner. In consequence, the insurance industry suffered further heavy losses as a result of Cyclones Eric and Nigel in 1985, causing the insurance industry to issue a warning that it might have to withdraw all cyclone insurance and resulting in the immediate withdrawal of two of the then six insurance companies operating in the country. A third company subsequently withdrew in around 1991, in part as a result of continuing financial difficulties relating to the 1985 cyclones. However, these companies have been replaced by others. A local insurance company was established in 1991. More recently, following relatively low domestic insurance losses as a consequence of Cyclone Kina together with domestic insurance industry profits of F\$2.2m in the same year (Reserve Bank of Fiji, 1994), two more insurance companies have entered the Fiji market.

Basic property insurance policies consist of either fire or general household policies, the latter providing cover against fire, theft and earthquakes. No cover is offered

Box 10.1**Building Codes**

The Fiji Building Standards Committee was originally established by the Commissioner of Insurance in 1984, in the wake of the destructive 1982/3 cyclone season, to examine the factors underlying the high incidence of cyclone damage. In 1985, following Cyclones Eric and Nigel, the government officially charged the Committee with the task of overseeing the preparation of a National Building Code which would provide some minimum standards both to reduce disaster-related losses and to help 'achieve stable and perhaps reduced hurricane insurance premiums' (Fiji Government, 1985a: 14)

The National Building Code was drawn up in the same year, providing guidelines to homeowners on the upgrading of properties to enhance their cyclone resistance. The Code lays down basic standards for building materials and structures in areas of differing hazard risk. It contains guidelines on fire resistance, access and egress, electricity, health and amenity, and ancillary provisions for dwellings, outbuildings, public buildings and group dwellings. Upon completion of one of three design upgrades detailed under the Code, houses are inspected by a structural engineer and then issued with a certificate. This certificate must be presented to secure cyclone insurance cover and mortgages. Fiji also follows the New Zealand 1965 seismic building code, which applies a single standard across the country.

In practice, it is difficult as yet to establish to what extent the Building Code has improved the disaster resistance of Fiji's building stock. Some attribute the relatively small levels of insured damage occurring as a result of Cyclone Kina to the improvement in building standards. Others argue that the success of the Building Code has yet to be fully tested, pointing out that Cyclone Kina was not a typical cyclone: it was relatively slow moving with a strength of only 2-3 (compared with strength 4 for Cyclones Eric and Nigel) but was accompanied by particularly heavy rainfall, resulting in record flood levels but causing relatively little wind damage the latter of which can potentially be particularly costly.

Adoption of the Building Code has also remained largely confined to urban areas to date. At the rural level, construction of public buildings such as schools, community centres and churches is normally checked by building inspectors but may nevertheless fall below urban standards. Meanwhile, individual homes are typically built by the owner and, particularly in the outer islands, are not inspected. In consequence, rural buildings may suffer much greater damage than urban ones as, for example, during Cyclone Kina, whilst damage to urban housing largely occurs in squatter settlements or villages on the outskirts of urban areas, which are also less likely to be built by contractors (Rokovada and Vrolijk, 1993). Buildings insured overseas may also not comply with the Building Code, as, for example, in the case with some smaller tourist resorts at least prior to Cyclone Kina (ibid.). Finally, there are some claims of corruption involving the issue of certificates to sub-standard buildings, implying that the scale of adoption of cyclone proofing measures may be less widespread than official records suggest.

against floods or volcanic eruptions whilst cyclone cover has to be obtained separately. Cyclone insurance is relatively expensive. For example, in the soft market conditions prevailing at the beginning of 1996 it was estimated that cyclone coverage

would increase premiums on a general household policy by about a third whilst as much as doubling them under tight market conditions.³⁹ Nevertheless, the uptake of cyclone insurance has been promoted by making the securing of mortgages conditional upon the acquisition of cyclone insurance. As a result, there is a relatively high rate of cyclone insurance coverage in urban areas, with perhaps 7–8% of the total population and, since virtually all policy holders are located in urban areas, 18–20% of the urban population covered by cyclone insurance. One insurance industry spokesperson interviewed for this study estimated that perhaps 90% of businesses, including all factories, also have cyclone insurance.^{40 41}

Despite high premiums, general data for property insurance indicates that such policies have sometimes involved massive losses for insurers.⁴² In particular, the 1983 and 1985 cyclones were largely responsible for net loss ratios (the portion of the loss which is born by the direct underwriters) of 110 and 885 in 1983 and 1985 respectively for fire insurance and 186 and 227 for property insurance policies, although insured losses as a result of Cyclone Kina were much lower (see Box 10.1).⁴³ To reduce the scale of losses to the domestic insurance industry, considerable use has therefore been made of reinsurance markets more recently, as demonstrated by a comparison of the pattern of claims as a result of Cyclones Oscar and Kina (Table 10.1). However, heavy reliance on the world reinsurance market also exposes Fiji to the vagaries of this rather unstable market, with fluctuations in premiums reflecting external, as well as domestic, factors.⁴⁴

³⁹ In February 1996, basic property insurance on a F\$100,000 house cost around F\$350 per annum, including a 10% or F\$1,000 deductible, depending on which was higher, in the event of an earthquake. Additional cyclone coverage would have increased the cost of premiums to around F\$550 per annum, with a 10% or F\$250 deductible on domestic properties and a 20% or F\$1,000 deductible on commercial properties in the event of a cyclone.

⁴⁰ In 1993, expenditure on household and fire premiums averaged F\$18 per capita or, assuming that policies were taken out entirely by urban dwellers, F\$45 per capita for the urban population.

⁴¹ In common with governments in many other developed and developing countries, public property is self-insured although all government housing is covered by commercial insurance policies.

⁴² Data on loss ratios for cyclone insurance are not available.

⁴³ Comparable figures on gross loss ratios were not readily available for this period.

⁴⁴ Until 1983 the world reinsurance industry were able to offset underwriting losses against substantial investments in money markets. Subsequent falls in world interest rates have forced reinsurers to rely on profits from underwriting activities, resulting in an escalation of insurance premiums. The international insurance and reinsurance industry faced a particularly difficult period in the early 1990s when the global incidence of natural disasters increased, precipitating an upward spiralling of premiums and a sharp reduction in the capacity of reinsurers.

Table 10.1 Domestic and reinsurance payouts as a consequence of severe cyclones, 1983–93

<i>Cyclone</i>	<i>Domestic insurance pay- outs</i>	<i>Reinsurance and off- shore insurance pay- outs</i>
Oscar (1983)	F\$53m	F\$34m
Eric and Nigel (1985)	F\$80m	n a.
Kina (1993)	F\$5m	F\$33m.

Unsurprisingly, domestic risks appear to have most bearing on premium levels in the immediate aftermath of a disaster. For example, in the wake of Cyclone Kina insurance premiums on some policies more than doubled and insureds were also asked to accept higher levels of deductibles (Reserve Bank of Fiji, 1994). At the same time, the insurance industry sought a reduction in reinsurance premiums in view of the supposed reduction in risks demonstrated by the cyclone (see Box 10.1). The reinsurance industry, in turn, expressed concern about earthquake risks in Fiji instead, culminating in the commissioning of a private investigative study of such risks by the Fiji insurance industry. This study revealed that an earthquake on the scale of the 1953 one could result in very high insured losses, in part because some areas of Suva and Nadi are built on reclaimed land. However, at this point the influence of global reinsurance conditions rather than domestic factors came into play and, rather than forcing reinsurance premiums up even further, premiums fell instead as the world reinsurance market moved into a period of improved profitability and concerns about the relatively small Fiji reinsurance market dissipated.

Indeed, as of early 1996, the Fiji market had become highly competitive after, in the absence of any natural disasters, the domestic industry achieved record profits in 1995. Premiums had fallen by some 20–40% whilst rates for the FSC, the largest insurance risk in Fiji, were reported to have been slashed by about a half. New companies were even rumoured to be demanding no cyclone-proofing certification for the issue of cyclone insurance policies. Some working within the insurance industry expressed concern about this trend and felt that Fiji almost needed a major cyclone to shake up the industry and increase premiums to a more realistic level.

In the wake of Cyclone Kina and the associated increase in premiums experienced by some policy-holders, businesses also exerted some pressure on the government to help reduce their exposure to fluctuating premiums by broadening the scope of the Cyclone Reserve, thus enabling companies to build up larger reserves from pre-tax profits and to reduce insurance premium payouts (see Chapter 9). Several organisations rely quite heavily on such reserves because they are no longer able to

obtain insurance at, from their perspective, reasonable levels of premiums and deductibles.⁴⁵ Options for a regional disaster insurance scheme have also been discussed on occasion (for example, PIDP, 1990). However, it is ultimately important that any such schemes remain relatively modest and that high levels of reinsurance are maintained because of the implied inflow of foreign exchange following natural disasters (see Chapter 5). Alternative schemes held in local currency could not have the same effect. In part for the same reason, efforts should also be taken to ensure that insurance risks are not under-assessed and thus that reinsurers do not make substantial losses in Fiji, either driving away potential reinsurers or increasing premiums to such an extent that there is a large decline in insurance coverage.

⁴⁵ For example, both Fiji Pine and the FSC operate Cyclone Reserve accounts. Since Cyclone Oscar, Fiji Pine has been unable to procure insurance at reasonable rates on its growing timber, which represented some 70% of its total assets in 1994. Instead, Fiji Pine has made regular annual payments into a Cyclone Reserve account to provide contingency resources in the event of damage resulting from fires and cyclones.

The FSC is the largest insurance risk in Fiji, as already noted, costing the insurance industry some F\$40m in the wake of Cyclone Kina. In 1994, faced with high premiums, the FSC established a Cyclone Reserve account into which it invested F\$2.5m in pre-tax profits annually. Latterly, international insurance interest in the FSC recovered. For example, when the FSC's insurance policy came up for renewal in late 1995, five international brokers quoted on it. Nevertheless, the FSC has also maintained payments into its Cyclone Reserve account.

11. Disaster management policy and practice

Considerable attention has been paid to disaster management in Fiji. These efforts have concentrated particularly on preparedness and post-disaster responses as well as technical disaster mitigation and preparedness projects. However, broader strategies to mitigate the economic impacts of natural disasters and to incorporate hazard risks into overall economic policies have been largely neglected. This chapter focuses particularly on the role which economic considerations have played in disaster management.

11.1 Disaster management

The country's formal disaster management structure dates back to 1960 when an Emergency Services Committee (EMSEC) was established as an *ad hoc* governmental committee in the Ministry of Finance with responsibility for warning, relief and rehabilitation efforts in the event of natural disasters and civil disturbances. The EMSEC was specifically not intended to meet long term reconstruction and rehabilitation requirements of disaster victims, let alone to undertake disaster mitigation activities. Meanwhile, the EMSEC's location within the structure of government represented less an effort to incorporate disasters into broader development planning than the fact that disaster relief required budgetary resources. The EMSEC was subsequently complemented by a Prime Minister's Hurricane Relief Committee (PMHRC), created in the wake of Cyclone Bebe (1972). The PMHRC was comprised of a group of private citizens under the chairmanship of the Prime Minister, working in collaboration with the Ministry of Agriculture and the District Administration. It had responsibility for the determination and formulation of relief policies and the implementation of reconstruction programmes but, again, did not have any responsibilities with respect to disaster mitigation. Similarly, the *EMSEC Precautionary Manual for Emergencies*, which was published in 1979, contained no reference to mitigation, which can potentially play the largest role in mitigating the economic impacts of natural disasters, except in the case of drought. Instead, it was essentially an emergency response plan.

The structure of disaster management was finally altered in 1990 to make it more comprehensive, covering prevention, mitigation, preparedness and rehabilitation activities as well as emergency operations and relief.⁴⁶ A new *National Disaster Management Plan* was also published in 1995, broadening the scope of the earlier

⁴⁶ In keeping with this shift of emphasis, responsibility for disasters was also transferred to the Ministry of Regional Development and Rural Housing because of its existing grassroots network.

1979 manual to include mitigation and rehabilitation, as well as outlining the roles and responsibilities of individual bodies and providing guidelines for operations and activities relating to all stages of disaster management (NDMC, 1995). The supporting role of non-governmental organisations (NGOs) in mitigation, preparedness and emergency response and rehabilitation was also detailed.

Although it could do more, this new Plan goes some way in promoting mitigation measures and represents a step forward towards a broader orientation of disaster management. For example, the importance of incorporating disaster proofing into rehabilitation efforts is recognised: 'if possible, ... rehabilitation efforts should also contribute to a reduction of the vulnerability of communities and public and private assets, in order to reduce the impact of future natural disasters' (NDMC, 1995: V-8). The new structure of disaster management also contains a Mitigation and Prevention Committee with a membership including the Permanent Secretaries for Finance and Agriculture amongst others. However, the committee does not include any representatives from, for example, tourism, industry or commerce. Moreover, the Ministry of Finance's broader role is defined, once again, in terms of ensuring that adequate financial resources are available for essential preparedness and relief measures rather than of developing diversification and growth strategies which explicitly take account of hazard risks.

On a more positive note, the Ministry of Agriculture is expected to play a more participatory role in disaster mitigation under the new Plan, providing advice on crop preparedness and mitigation measures, including the best methods to safeguard crops, livestock, equipment and plants from the effects of natural disasters. The ministry is also expected to work closely with the Public Works Department in flood control and watershed management programmes. Meanwhile, the Fiji Electricity Authority, for example, is expected to undertake some disaster mitigation measures by ensuring that power lines and other installations are kept clear of trees and other possible obstructions.

Nevertheless, the more general lack of importance attributed to a cohesive mitigation policy in the new Plan is further undermined by the fact that the Mitigation and Prevention Committee does not meet regularly. For example, no meetings were held in 1995. In addition, there does not appear to have been any real effort to ensure that mitigation activities are adopted at the grass roots level. Further evidence of the limited interest in disaster mitigation is demonstrated by the fact that the National Building Code was scheduled to be put before Parliament in 1996, some eleven years after it was first drawn up, despite the fact that it had always been intended that the Code would be enacted.

The National Disaster Management Office (NDMO) itself is also constrained in the extent to which it can become involved in disaster mitigation activities. As of early

1996, it had only four permanent staff although certain efforts were being made to strengthen it and increase its autonomy. In the meantime, the NDMO was focussing its efforts on disaster preparedness and relief, reflecting financial and personnel shortages.

In contrast, the new Plan carefully outlines a number of measures for promoting disaster preparedness, awareness and training. Indeed, the government has been quite active in promoting preparedness activities over the past couple of years – in itself a very positive development – and considerable efforts are being made to increase awareness of natural disasters. For example, a National Disaster Awareness Week, which is mentioned in the Plan, is held annually in October, prior to the beginning of the cyclone season. The funding for this is not assured, however, and in 1995, for example, was only approved by the Ministry of Finance after some cajoling. The NDMO is also working through schools, women's groups and the media to increase preparedness awareness. In 1994 and 1995, efforts focused on a poster campaign and, in 1995, radio broadcasts as well, informing people how to act in the event of cyclones, tsunamis, floods and earthquakes. The Ministry of Education has responded particularly well to the need for greater disaster awareness⁴⁷ whilst governmental preparedness measures have been complemented by the efforts of certain NGOs and the Fiji Red Cross. Meanwhile, before each cyclone season, stocks of government emergency supplies throughout the country are inventoried whilst the Fiji Red Cross also places stocks of disaster packs around the country and people are encouraged to store food and water.

Adequate warnings are also important, both in saving lives and reducing physical damage. Again the *National Disaster Management Plan* attaches considerable importance to alerts and warnings, including good communications. The current state of scientific knowledge also permits warnings of cyclones, floods and some tsunamis although earthquakes cannot be predicted. Meanwhile, the extent and nature of drought events unfolds slowly and requires careful monitoring. The Fiji Meteorological Service has had long experience of preparing cyclone warnings, both for Fiji and most of the South Pacific more generally; and issues special weather bulletins some 36–48 hours before they strike land. These allow endangered populations some opportunity to secure window shutters, tie down roofs, put equipment and vehicles under cover and so on, effectively reducing the extent of damage. Offices and schools are also shut and people remain in their own homes, or with friends or relatives who are perceived to have safer houses, for the duration of the cyclone. Such measures can play an important role in minimising the impact of disasters, particularly in terms of loss of life.

⁴⁷ Currently disasters are covered under several subjects, including geography and social sciences. The idea of introducing disaster management onto the school curriculum, as a subject in its own right, has even been mooted.

Finally, the nature of disaster response can be important in determining the pace of economic recovery. However, the *National Disaster Management Plan* is rather weak in this regard, at least with respect to the importance it attaches to ensuring a rapid such recovery. The Plan states that public sector rehabilitation efforts 'will be based on full assessment of the impacts of the disaster, including direct and indirect effects' (NDMC, 1995: V-3). However, there has been little actual analysis of either indirect or secondary effects and, instead, efforts focus on physical reconstruction on the apparently implicit assumption that any indirect effects will be automatically addressed as well. 'Economic recovery' is listed in the Plan under typical post-disaster needs for earthquakes but not under those for cyclones, floods, landslides or droughts. Only in the case of drought is any attention paid the need to address to more specific economic impacts such as price instability and increased unemployment. Provision of seeds for planting is only listed under cyclones although, again, this is an important measure required in the aftermath of most disasters to speed recovery.

11.2 Disaster prevention and mitigation measures

Disaster prevention and mitigation activities are potentially particularly important in minimising the broader economic consequences of a natural disaster and so are worthy of particular consideration. Such efforts have focused primarily on cyclones and floods. Some drought activities are also being undertaken but are not well coordinated (see Box 11.1).

In terms of flood, and indirectly cyclone, prevention and mitigation, Fiji's Ninth Development Plan (1986-90) called for a range of structural measures – namely, a programme of construction and maintenance of drainage; river-dredging, and proper catchment area management. The country has since established a River Improvement Management Plan which provides the basis for an integrated river improvement programme covering dredging, flood and bank protection works (Rokovada and Vitoljks, 1993). Such measures have had some success. For example, dredging operations were partly successful in reducing the levels of floods experienced following Cyclone Kina. Major drainage works are also undertaken annually

However, structural prevention and mitigation efforts are effectively constrained by high per capita investment costs in small islands. For example, the Ministry of Regional Development estimated that coastal protection of the island of Serua, which lies just off the southeast coast of Viti Levu has just one village and faces considerable coastal erosion problems due to high winds and cyclones, would cost around F\$250,000 (Porter, 1994). In terms of minimising the impacts of disasters, such costs imply the need for an alternative mitigation strategy which ensures that agricultural and other livelihoods are well-adapted to the prevailing environment instead.

Box 11.1**Water Strategy**

Parts of Fiji regularly experience dry periods, as already noted, whilst ability to both tap and preserve water supplies also varies considerably. Some water-related investments are being undertaken, involving a number of government ministries. Some communities have also initiated self-help measures, usually under a scheme whereby recipients meet a third of the cost and the government the remainder. However, these efforts are not particularly well-coordinated and the most drought-prone areas not necessarily targeted. Part of the problem lies in the fact that mapping of groundwater resources is incomplete. At the same time, some areas continue to rely largely on hand-dug wells despite surveys indicating that underground water supplies exist which could be tapped through the drilling of boreholes.

Meanwhile, water usage is gradually increasing as populations expand and the water reticulation system extended (Porter, 1994). Demand for water will inevitably increase further with, for example, rising standards of living, continued expansion of irrigation networks and growth of the tourist industry. There are even fears that urban water supply, which to date has been relatively secure, could be threatened (UNDHA-SPPO, 1993). The 1987 drought has already resulted in the introduction of water restrictions, including in Suva and Nausori. Competition for water has also increased since the commissioning of the Monasavu Hydro Power Scheme in 1983, requiring considerable volumes of stored water to operate at full capacity. By 1992, this station accounted for approximately 90% of electricity production, implying that future water shortages could reverberate on industrial processes as well as health and other services by resulting in power shortages. They could also imply increased energy imports, exerting pressure on the external sector, particularly as the government plans to increase reliance on hydro-electricity-generating plants further as part of efforts to reduce the overall volume of imported energy products. The Monasavu dam ran short of water for several weeks during the 1992 drought (NDMC, 1995) and similar shortages could occur again.

Essentially the country requires a comprehensive water strategy identifying water resources and appropriate techniques to exploit that water on a systematic, national basis. The strategy should also consider all aspects of water usage. This is by no means a new idea although such a strategy has yet to be drawn up. For example, the *Opportunities for Growth* document states that: 'Attention needs to be given to increasing knowledge of water as a resource, coordination and prioritisation of competing demands on the resource, and long term planning to ensure sustainable development' (Fiji Government, 1993: 117)

Faced with increasing competition for water usage, the government also needs to promote water conservation practices. Rainfall statistics dating back at least to the turn of the century need to be examined to identify any long-term trends and water consumption needs adjusted in accordance with them. Water users, particularly industrial ones, also need to be charged prices equated to the long-run marginal cost to of water ensure full cost recovery and to encourage water conservation practices. Urban water rates are currently set well below marginal cost, and there appears to be limited appreciation of the urgent need for marginal cost pricing. Meanwhile, the World Bank (1995) notes that currently inadequate cost recovery is demonstrated by the fact that planned maintenance and upgrading is failing seriously behind schedule. The government also needs to work hard to overturn the general perception of unlimited availability of water (Porter, 1994).

At least in the past, structural mitigation efforts may also have been constrained to some extent by insufficient public appreciation of their benefits. For example, such a lack of understanding was said to be attributable for certain problems encountered in the implementation of the drainage works component of a World Bank funded reconstruction project in the wake of Cyclone Wally (1980) which was hindered by a reluctance on the part of farmers to allow drainage facilities to be built on their land or to permit right-of-way access (World Bank, 1985).

Non-structural disaster prevention and mitigation measures include disaster-proofing of buildings, measures to upgrade flood-vulnerable roads and the taking out of insurance policies (see Chapter 10) as well as various adaptations to agricultural practices (see section 4.1).⁴⁸ Some risk hazard mapping is also currently under way. However, there is scope for further vulnerability assessments as a basis for designing additional measures to reduce the impact of natural disasters. For example, Rokovada and Vrolijkx (1993) call for a more systematic assessment of the road network and power supply.

11.3 Broader economic policy and disasters

The country's economic vulnerability to natural disasters is clearly recognised by the government and international agencies. For example, the *National Environmental Strategy* states that Fiji '... is subject to potentially catastrophic climatic events such as cyclones, earthquakes, flooding and multiple land-slips which can have a major impact on the economy and infrastructure' (IUCN, 1993: 3). The adverse impacts of natural disasters also feature heavily in accounts of economic performance *ex post*, particularly since the early 1980s, as, for example, in various Fiji Government budget statements. Indeed, as Carter et al. (1991: 267) argue 'Any development scenario for these small (South Pacific) economies is likely to be flawed if it does not take into account the impact of frequent natural disasters, especially on infrastructure facilities'. Meanwhile, the *Fiji National Disaster Management Plan* recognises that disaster mitigation activities should not just be project-based but also 'form part of the overall development efforts of Fiji' (NDMC, 1995: VI-2). Yet, most official general policy documents produced by the Fijian government and regional and multilateral organisations have paid little attention to natural disasters in the formulation of overall policies or planning. For example:

⁴⁸ There are certain inherent contradictions in designing building structures which are resistant to all types of hazard experienced in Fiji. For example, the Town Planning Act enforces the construction of houses on piles in low-lying areas, reducing their vulnerability to floods but increasing that to earthquakes.

- The 1993 document *Opportunities for Growth: Policies and Strategies for Fiji in the Medium Term* (Fiji Government, 1993) makes a number of references to the impact of Cyclone Kina, which occurred whilst the document was being drawn up, on agriculture, forestry, infrastructure and buildings. It also notes that cyclones 'are not uncommon in Fiji and their disruption has to be accommodated with minimum detriment to the implementation of longer term policies' (p14). Yet, although it states that 'environmental management is an integral part of the planning and development process' (p.78), it does not make the same point about natural hazard management. It also largely ignores natural disasters at the sectoral level. For example, natural disasters are not included in the discussion of agricultural sector constraints whilst measures to reduce vulnerability to natural disasters are not listed under "essential" components of agricultural policy and strategy. Indeed, the only place where disasters are specifically identified as a sectoral constraint is in the discussion of Fiji Pine where forest fires are mentioned. Meanwhile, the document identifies a need for long-term water resource planning to help ensure that the economy remains on 'an environmentally sound growth path' but does not acknowledge the potentially serious economic implications of water shortages.
- The *Suva Declaration on Sustainable Human Development in the Pacific*, drawn up at the Twenty-Fourth South Pacific Forum in 1993, identifies a number of constraints to sustainable growth but fails to mention natural disasters (Forum Secretariat, 1994). The Declaration advocates development strategies which, amongst other things enhance the productivity of the rural and subsistence sector, address inequality and emerging poverty, overcome regional disparities and support environmental regeneration. The attainment of such objectives could be undermined in the event of a natural disaster yet, again, disasters are not mentioned.
- In the official report of the Twenty-Fifth South Pacific Forum global warming and sea level rise are identified as 'among the most serious threats to the Pacific region and the survival of some island states' (Forum Secretariat, 1995) but there is no mention of natural disasters
- A 1995 World Bank report includes some reference to the impact of natural disasters on production of certain crops; and acknowledges vulnerability to natural disasters as one of Fiji's 'handicaps'. Yet it fails to suggest the promotion of policies which aim to reduce that vulnerability, even within the narrower context of the agricultural sector (World Bank, 1995).
- The *National Environment Strategy* (IUCN, 1993) recognises the cross-cutting nature of environmental issues and the need to incorporate them into all aspects of government business because 'environmental policies designed in

isolation of other sectoral and national goals are difficult to implement and frequently fail' (p.29) Yet little is said about, effectively, the reverse process – ie, the impact of the environment, including natural hazards, on development – other than in calling for strategic long-term planning for resources which may be affected by climate change, particularly sugar cane cultivation in the dry zones of Viti Levu and Vanua Levu which could be adversely affected by increasingly dry conditions (IUCN, 1993).

In contrast, considerably more interest has been paid to environmentally sustainable development as one of the three central themes of sustainable human development. Environmental policies and objectives have been included in government documents dating back to 1971 although, in practice, implementation difficulties have been encountered due to several factors including lack of integration of development and environmental policies and inadequate and highly sectoralised legislation (IUCN, 1993). Similar factors appear to hinder consideration of natural disasters in overall economic policy-making.

However, it is not entirely clear what factors underlie the general malaise in incorporating hazard risks into broader economic policy. Admittedly, environmental issues, for example, probably demand greater attention as environmental degradation is directly linked to human actions and presents a continual threat whereas natural disasters occur infrequently. Nevertheless, human actions also partly determine the scale of impact of natural hazards and, when they do occur, disasters may constitute severe exogenous economic shocks. Part of the problem of incorporating hazard risks into economic policies and strategies must lie in the current nature of post-disaster assessments which, as discussed below, largely fail to take account of indirect and secondary impacts and so may considerably underestimate their full costs.⁴⁹ If the latter was more transparent, then this alone could push policy-makers into action. There may also be some sense of collective non-responsibility – that is, that because the impacts of disasters are so all-pervasive, potentially reaching into most aspects of the economy, no government ministry or department is willing to recognise them as in part their own responsibility.

⁴⁹ Cost-benefit analyses of disaster prevention and mitigation projects also appear to entail a very narrow definition of economic benefits. For example, an economic assessment of the benefits of a flood protection scheme in the Rewa Delta was undertaken which included a valuation of the types and value of assets which would be damaged or destroyed under varying flood scenarios (UNDP/FAO, 1994) but excluded any consideration of the indirect or secondary impacts of a flood. On some occasions, such narrow approaches could imply that a decision is not taken to invest in a potentially highly beneficial project, particularly if social benefits are also excluded from the analysis.

11.4 Damage assessment – an obstacle to comprehensive disaster mitigation strategies?

Current efforts to assess the economic impacts of natural disasters in Fiji are essentially confined to post-disaster damage assessments. Such assessments should aim to serve two purposes. First, they should provide essential information upon which appropriate and timely responses can be based, addressing both short-term humanitarian needs and efforts required to ensure a rapid economic recovery. Second, damage assessments should form a fundamental component of efforts to ascertain the broader economic impacts of disasters, providing important information for policy-makers in furthering their understanding of possibly changing economic vulnerability to natural hazards and in determining how economic development can be directed towards reducing that vulnerability. The *National Disaster Management Plan* recognises the importance of maintaining proper records of disaster experiences for use in improving future plans, policies and procedures. Indeed, one of the missions of the Preparedness Committee is 'to establish a simple but effective data base on natural disaster damage and protective control mechanisms as a guide for policy direction and programme development' (NDMC, 1995). However, to date the scope and quality of disaster assessments is somewhat limited and needs to be improved before a really useful database can be developed.

Part of the problem lies in the currently short-term nature of assessments. In the aftermath of a disaster, daily briefings are prepared by Emergency Operation Centres at the national, divisional and district levels. According to guidelines laid out in the 1995 *National Disaster Management Plan* and broadly reflecting recent practices, a series of reports should also be prepared at the national and divisional level comprised of the following:⁵⁰

- initial damage and relief needs assessment reports (within 48 hours);
- relief needs assessment reports (within 1 week); and
- damage assessment and outstanding relief needs reports (within 2 weeks).⁵¹

At the end of an emergency operation, a debriefing and review of the operation should then be produced, outlining outstanding relief needs. Additional assessments should be prepared for rehabilitation programming, taking into account baseline data where available.

⁵⁰ These assessment procedures were clearly laid out in the *National Disaster Management Plan* partly in response to inadequacies in the assessment process which were revealed following Cyclone Kina. They broadly reflect past practices but hopefully, when they are put to the test in the next disaster, will provide for a fuller and more systematic assessment.

⁵¹ Droughts do not fit into this format and, in practice, drought assessments are limited to an assessment of emergency water supplies.

The primary purpose of this series of assessments is to identify the impact of a disaster and indicate emergency response, relief and rehabilitation requirements (NDMC, 1995). Information should be provided on the numbers affected; the numbers of homes destroyed or damaged, damage to food crops, cash crops and livestock and the availability of food; damage to essential services and facilities; and damage to roads, bridges and overall accessibility of areas. Assessment reports sometimes refer to disruption to trade as a consequence of infrastructural damage but no attempt is apparently made to cost this economic loss. Additional reports are provided by other public and private institutions – such as the Fiji Electricity Authority, the Fiji Sugar Corporation, the Public Works Department, Telecom, the Fiji Pine Commission, the Red Cross and NGOs – and incorporated into the national and divisional reports.

However, these procedures fail in one important respect: according to them, the final debriefing should occur perhaps only 6 months after a disaster. At this stage it is far too early to assess the full impact of a disaster on, for example, the balance of payments, the government budget, or the allocation of budgetary resources. There has been some improvement in this regard to the extent that in the immediate aftermath of Cyclone Kina both the Reserve Bank of Fiji and the Ministry of Finance undertook brief economic assessments of the damage incurred, considering the price, balance-of-payments and budgetary effects as well as direct impacts on productive sectors and infrastructure. However, the Ministry of Finance's paper was drawn up in February 1993 and the Reserve Bank's one even earlier, in January – that is, only a few weeks after the cyclone – and so were based largely on conjecture rather than hard fact. Neither document was subsequently updated nor any effort taken to consider the lessons learnt in terms of strengthening the economy against future disasters. Furthermore, the 1995 manual did not outline any requirement for broader economic assessments of the impacts of disasters at any point in the assessment process.

Other problems have also been encountered in the past. For example, relevant ministries have typically failed to pool their reports, undertaking initial survey and assessment work separately. This has effectively undermined the coordination of the overall relief and rehabilitation operation, as, for example, in the case of Cyclone Kina where poor coordination and thus incomplete knowledge of the extent of damage and existing relief efforts implied that the government was unable to respond to some offers of international assistance in good time (Rokovada and Vrolyks, 1993). To date, any efforts to implement standardised reporting formats have also failed, effectively hampering efforts to construct a clear picture of the precise nature

of the damage caused by disasters.⁵² The general literature on the agricultural impact of natural disasters is particularly thin, especially as concerns subsistence crops.^{53 54}

More positively, to help ensure accurate assessments of damage in the future, districts, divisions and the NDMO are also expected to collate baseline data according to the *National Disaster Management Plan*. These should include information on population distribution, agricultural areas and the location of key facilities; and should be reviewed annually, prior to the start of the cyclone season in September. If implemented, this could represent a major step towards an improved assessment of the broader economic impacts of natural disasters, in turn helping to promote appropriate agricultural and other policies.

⁵² UNDHA have also produced two booklets on disaster assessment in the Pacific in recognition of the need for improved practices. However, these booklets are not used, at least in Fiji. In 1991, there appears to have been another effort to introduce a standardised format for reporting damage, this time on the initiative of the Fiji Government. Draft forms were drawn up by the Ministry of Regional Development, covering damage to crops, houses and schools. They were then circulated for comment but apparently not taken any further.

⁵³ This is partly attributed to the 'unreliability and lack of objectivity of crop loss appraisal methods' (Amerasinghe, 1984: 143). Lack of trained personnel presents a further problem whilst assessments may be complicated by multi-cropping. The impact of natural disasters also extends beyond crop losses to factors such as reduced plantings, the purchase of new planting materials and other agricultural inputs to replace lost ones and even loss of export markets. Yet it may be difficult to gauge the impact of natural disasters on such factors as crop planting decisions.

⁵⁴ This is true not only of Fiji but also of the South Pacific more generally.

12. Traditional coping mechanisms

Traditional coping mechanisms to deal with the effects of natural disasters, including both longer-term mitigation measures and shorter-term preparedness measures, have been developed over centuries in both Fiji and the Pacific more generally. Early recognition of an annual cyclone season was reflected in the naming of the months.⁵⁵ Preparedness measures were traditionally based on certain weather and animal behaviour patterns which were believed to foretell a hurricane, some of which have subsequently been proven to have a scientific basis.⁵⁶ In recent times, these have been supplemented by meteorological warnings which, for example, enabled the country to be placed on alert four days before Cyclone Kina struck (Rokovada and Vrolijk, 1993).

However, there is reported to have been a gradual breakdown in traditional mitigation and coping mechanisms (e.g., Carter et al., 1991). There has also been much discussion of the emergence of a relief-dependency syndrome, with communities increasingly relying on government and international donor efforts, rather than self-help initiatives, in the aftermath of disasters.

Various factors have contributed to these trends.

- **Changing agricultural practices** – as already discussed, there has been a shift away from multi-cropping towards production of just a few crops together with much reduced cultivation of more disaster-resistant crops. Some commentators point to increasing reliance of households on cash crops for export as their major source of income as another factor contributing to increased vulnerability (Carter et al., 1991). Certain traditional practises to preserve food supplies for use in the event of a natural disaster are also dying out (see section 4.1).
- **Increasing poverty** – various commentators have suggested that levels of poverty in Fiji are probably increasing (e.g., Bryant, 1992; Chung, 1995), particularly following the 1987 coups and the subsequent economic decline. A draft poverty study, under preparation by the Central Planning Office with UNDP assistance as

⁵⁵ Fijians divide the year up into a number of periods which refer to various natural phenomena. The months from December to February are variously known as the *vula i katakata* ('hot season'), *vula i solelaca* ('sail-wrapping season') and *vula i tabulaca* ('season when the sail is prohibited'), the last two referring to the fact that sailing is not normally undertaken during this period because of the threat of hurricanes (Rokovada, no date).

⁵⁶ For example, both ancient and modern-day Fijians believe that when a breadfruit tree is heavily laden with fruit there will be a hurricane (Amerasinghe, 1984).

of early 1996, has estimated that some 25% of the population live below the poverty line (based on Household and Income Expenditure Survey data from 1990–1), compared with under 20% in 1977. It has been recognised that a large proportion of the poor are located in ecologically fragile areas and that their economic and social deprivation is one of the factors contributing to further environmental degradation (e.g., Norindr, 1993). It has also been recognised that natural disasters contribute to poverty. However, the fact that the poor are also particularly hazard-vulnerable by definition of their location, as well as, commonly, quality of housing and that disaster vulnerability must be addressed as part of wider efforts to reduce poverty have yet to be incorporated into any anti-poverty strategies.

- **Population and land pressure** – this has contributed to the gradual cultivation of marginal lands as well as the construction of housing in increasingly hazardous areas, particularly those vulnerable to landslides, as urban areas expand. Newer developments also tend to be located in drier areas rather than near adequate water supplies (Porter, 1994)
- **Modernisation of the housing stock** – there has been a gradual shift from the use of traditional to modern housing designs and materials which has probably been accompanied by an increasing level of sub-standard housing. Traditional *bure* (thatched) housing could be relatively easily replaced in the aftermath of a disaster; and was relatively safe, with fairly low risk of fatalities or injuries in the event of cyclones or earthquakes. However, *bure* houses are an increasingly rare sight. For example, a survey of 124,098 households in 1989 reported that only 9% of houses were still constructed from *bure* materials (Fiji Bureau of Statistics, 1989). Instead, even on the outer islands, housing is increasingly constructed from cement, timber and corrugated iron. Such structures are not necessarily less disaster-proof, depending on their design, but poorer households can only afford lower quality modern building materials, may use a combination of traditional and modern materials and may not apply the Building Codes, together implying a decline in the level of disaster-resistance. The Ministry of Rural Housing funds some housing construction which should be built in accordance with the one of several building plans satisfying Building Code requirements but, in reality, carpenters and builders may lack the skills to follow these plans (Carter et al., 1991).

There is no systematic source of information about sub-standard housing (Chung, 1995) or about the proportion of housing stock which does not incorporate cyclone proofing features. However, the level of squatter housing – which is both sub-standard and unlikely to incorporate cyclone-proofing features – is increasing. For example, a 1986 survey revealed that 1 in every 8 people in Suva was a squatter (Bryant, 1992). Forecasts suggest that over the next 15 years, almost

19,000 additional urban houses will be required to meet increasing demand as urbanisation continues (IUCN, 1993). This substantial expansion could result in construction of further sub-standard housing, increasing the vulnerability of both the housing stock and individual households to natural disasters.

- **Breakdown of the extended family system** – some argue that the importance attached by indigenous Fijian society to the extended family and the practice of reciprocity and sharing within a community has played a major role in mitigating household impacts of disasters, preventing acute deprivation of individual households or people. This system has to some extent deteriorated as households have become increasingly involved in the market economy. However, the extent of the system, even in the past, has perhaps been exaggerated. For example, Bryant (1992: 92) comments that 'disparities in access to basic necessities occur much more frequently than might be expected in a society where social networks are theoretically intended to ensure that such situations do not occur'. Chung (1995: 8) also questions whether 'practices and systems of production (are) really designed to "share and care for those in need"?' Several surveys have also indicated that intra-community disparities may be much greater than generally believed. Furthermore, there is reported to be no economic interdependence between Indo-Fijian households, (Chandra, 1983) who formed 45% of the population in 1993 and, presumably, a greater share of the lower-income groups.

Attitudes to disaster relief in Fiji are also reported to have changed. For example, Amerasinghe (1984) reports that in the late 1940s offers of cash relief, even on a loan basis, were only accepted with reluctance by inhabitants of the outer islands while rural housing was rapidly repaired by the affected communities in the aftermath of a disaster. However, in the more recent wake of Cyclone Meli (1979), for example, victims awaited the arrival of relief items rather than eating uprooted dalo and cassava. Increasing availability of relief supplies has been held partly to blame for the apparent breakdown of traditional coping mechanisms (e.g., PIDP, 1990). However, others view the increased government intervention in the aftermath of a disaster as a response to a perceived reduction in the ability of communities to cope, rather than the other way round (Rokovada, no date).

Finally, despite the general increase in vulnerability of poorer households to natural disasters, little research has been undertaken on the economic impacts of disasters at the household level, either in Fiji or elsewhere in the Pacific. Such studies should form an essential underlying component of any anti-poverty strategies, covering issues such as the extent to which household indebtedness increases as a consequence of natural disasters and the role of disasters in contributing to rural-urban migration. Action should also be taken to ensure that knowledge of traditional coping mechanisms is not lost.