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Affordability and participation, need and vulnerability: Post-cyclone rehousing in Tonga

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Opportunity to briefly review the current situation in Tonga occurred in November 1988 during a field mission to study the implications of sea-level rise in atoll island countries of the South Pacific, for the Commonwealth Secretariat Expert Group on Sea-level Rise and Climate Change.

AFFORDABILITY & PARTICIPATION, NEED & VULNERABILITY: POST-CYCLONE REHOUSING IN TONGA.

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SUMMARY
(Submitted Abstract)

The Kingdom of Tonga is an archipelago in the South Pacific, of more than five hundred miles in extent. Three principal island groups of Vava'u, Ha'apai and Tongatapu extend more than three hundred miles. In addition to earthquakes and volcanic eruptions there have been more than thirty hurricanes in the past one hundred years.

In the twenty-four hours of 3 March 1982, Hurricane "Isaac" destroyed more than a fifth of Tonga's national housing stock. As it traversed in turn the three principal island groups of the archipelago, some islands lost up to one hundred percent of their houses. In half of the villages of the Ha'apai Group, seventy percent of houses were destroyed. On Tongatapu, the largest island, the hurricane coincided with high tide and caused similarly high losses to housing built on land below sea level. On 'Uiha Island, the sea swept through the village carrying with it houses, animals, trees and debris. Total damage was assessed as US$ 20 million, of which 40% was to buildings - nearly two thirds of which were houses.

Special post-cyclone assistance to Tonga amounted to one fifth of the total cost of damage - by far the greater proportion of damage and loss being borne nationally. In June 1983, a jointly funded rehousing programme was well established and more than half of accepted applications for houses had been met or were in hand. By the end of 1986 "the whole task of building new houses" had been completed, organised and managed by the Tongan authorities and the UK Building Research Establishment.

Applications for rehousing did not however reflect the need for rehousing. Of the cost of each house at $2900, applicants were required to contribute one quarter, being $700. Families ineligible for bank loans, without access to remittances from overseas, unemployed, sick or elderly, were unable to contribute this amount and were thus unacceptable as applicants. In 1983, it had become apparent from damage surveys as well as being locally and visibly obvious that many were still in need. At that time, less than half of destroyed dwellings had been replaced. (A visit Tonga in November 1988 will provide opportunity to investigate progress since 1983).

Financial constraints preclude participation; judgements about affordability obscure social need. In place of the ***provision*** of houses, would not international financial assistance have been made more equably available through assistance with rebuilding - and knowledge of improved construction techniques become more widespread? Need exposed by the system now, will be vulnerability exposed by the next and subsequent hurricanes.

AFFORDABILITY AND PARTICIPATION, NEED AND VULNERABILITY: POST-CYCLONE REHOUSING IN TONGA

The Kingdom of Tonga is an archipelago in the South Pacific Ocean, south-east of Fiji, with a national population of 100,000. Three principal island groups of Vava'u, Ha'apai and Tongatapu extend over a distance of more than three hundred miles which, with the additional islands to the north of Niuatoputapu and Niuafo'ou, is the major part of an island chain extending over five hundred miles. In addition to earthquakes and volcanic eruptions (Lewis, 1979; Rogers, 1986), there have been more than thirty damaging tropical cyclones (hurricanes) affecting one part or another of the archipelago, in the past one hundred years (Lewis, 1978).

Hurricane damage

In the twenty-four hours of the 3rd of March 1982, Hurricane "Isaac" destroyed more than one-fifth (22%) of Tonga's national housing stock. As it traversed in turn the three principal island groups of the archipelago, some islands lost up to one hundred per cent of their houses. In half of the villages of the Ha'apai island group, seventy per cent of houses were destroyed (all twenty houses on Matuku Island [population 150] were destroyed; 87% on 'O'ua and 74% on Mo'unga'one, all single village islands). On Tongatapu, the largest island and location of the capital Nuku'alofa, the hurricane coincided with high tide. The hurricane's associated sea-surge caused similarly high losses to dwellings built at or below sea-level. On 'Uiha Island, the sea swept through the two villages carrying with it houses, animals, chickens, trees and debris. Total damage to Tonga was assessed as TS$ 19 million (US$ 20 million), of which 40% was to buildings - nearly two-thirds of which were housing. The Ha'apai Islands lost 72% of their houses, the Vava'u Islands lost 29% and Tongatapu

lost 12.5%; a total of 3,042 houses were destroyed - 22% of the national housing stock.

At October 1982, special post-hurricane assistance to Tonga amounted to T$3.8 million - 20% or one-fifth of the total estimated cost. By far the greatest proportion of the cost of damage and loss was thus borne nationally (Lewis, 1983).

Rehousing programme

In June 1983, a jointly funded rehousing programme was well established, more than half of accepted applications for houses had been met or were in hand (Table 1).

TABLE 1: Accepted applications and the rehousing programme at June 1983
(Source: NODDR in Lewis, 1983).

Accepted applications*	2,750	
Total built	1,148	
Number in hand	500	(see text underlined below)
Total built and in hand	1,648	
Requirement outstanding	1,102	
Additional requirement*	398	(approx)
Total outstanding	1,500	

* The total requirement increases slowly as more applications are accepted (see text below): and some destroyed houses escaped the original survey.

The rehousing programme was jointly funded by the EEC through the Lomé Convention and the Australian Development Assistance Bureau, with technical assistance in hurricane resistant dwelling construction from the United Kingdom Building Research Establishment. The programme was managed by the Tongan National Office for Disaster Relief and Reconstruction (NODRR) and

the Tongan Ministry of Works. Ministry construction gangs erected prefabricated timber wall panels and corrugated iron roofs for standard 35 square metre houses on concrete floorslabs. The total of 500 houses in hand (above) at June 1983 was then the maximum allowable under the current funding programme. Within two years however, "the whole task of building new houses to replace the 2000 plus lost in Cyclone "Isaac" had been completed" (BRE, 1985).

The rehousing need (1983)

Applications for rehousing did not however reflect the real need and therefore, neither did the rehousing programme. Of the cost of each new house, at T$2900, applicants were required to contribute one-quarter, being T$700. Those unable to do so and those families without access to remittances from overseas or ineligible for bank loans, the unemployed, the sick or the elderly were thus unacceptable as applicants - and thus did not appear in the "total requirement". In June 1983 it had become apparent from damage surveys, as well as being locally and visibly obvious, that many were still in need. In reality at that time, less than half of the total number of destroyed dwellings had been replaced (Table 2).

TABLE 2: Houses destroyed; accepted applicants; and extra to the rehousing programme (Source: NODRR in Lewis, 1983)

	Houses destroyed	Applications accepted for rehousing	Extra to the rehousing programme
Tongatapu	1,070	524	546
Ha'apai	1,273	610	663
Vava'u	699	306	393
	3,042	1,442	1,602

Even in making allowances for the later date and relative imprecision of the BRE statement above, there would have been a shortfall of a thousand houses had numbers provided been set against the real need instead of against the "requirement" of accepted applications.

The rehousing need (1988)

In November 1988, six hundred families remained without rehousing, outside of the total rehousing provision of both the Tongan Government and the "very few" built by church organisations. The reconstruction programme expired in 1986; at that point existing funding was exhausted and no other funding had been made available (Ministry of Works, 1988).

In 1986, applicants' contributions remained at their original amount of T$700, though the cost of houses had risen to T$6000 through inflation of the cost of materials, transportation (throughout the three island groups) and salaries. Thus in time, what funding had been available provided less and less: "If all applicants had come at once, all could have been provided for within the aid budget . . . only yesterday a couple came with their seven hundren pa'anga, but the programme has stopped and they could not be provided for. They were advised to put their money into the bank. . . ."

"Affordability" and vulnerability

Three interacting factors conspired to exacerbate the effects of inflation: delays or shortfalls in funding intermittently interrupted or delayed the rehousing programme; the requirement for a T$700 contribution from applicants had the effect of delaying many applications - some for as long as up to four years; the number of applicants at any time was never absolute and thus their number that funding would have to cover was

therefore never certain. Delays and uncertainty brought about or induced by the management of the programme, conspired to incrementally increase the effects of inflation and thus to reduce the programme's effectiveness.

The official retrospective view in Tonga is that "the people now know that they must have money in the bank" to ensure their rehousing priority after another hurricane. In reality however and at the other end of the scale, those who have been unable to pay their contribution for rehousing this time will be the most vulnerable to the next hurricane. The poorest are invariably hit the hardest. They will be the most vulnerable because they live in shacks made of hurricane debris and, because of their substandard housing conditions, they will have become subjected to illness and disease. They will be the most vulnerable because they will also have become destitute and alienated by the society in which they live, ineligible for the assistance of their communities and government and least able to withstand the aftermath of the next hurricane (Lewis, 1988).

The imposition of financial constraints precludes participation on the basis of need; judgements about affordability obscure need and disregard those who are most in need. International assistance would have been more equably accessible and knowledge for improved techniques of hurricane resistant construction would have been made more widespread, had assistance been spent on locally trained and mobilised construction and not so much on the centralised **provision** of prefabricated house components.

Dependancy on that provision, for some, and exclusion from that provision, for others, join to create a social vulnerability that is an inevitable

product of the system that prevails - in spite of the technical and financial products that the system produces.

In 1978, the system in Tonga was shown to be socially and culturally capable of readapting itself to the indigenous hazards it was in danger of ignoring to its cost (Lewis, 1981):

> "By the regeneration of local coping mechanisms . . . interdependance and self-reliance will probably arrest those processes which have hitherto accelerated dependancy on central government, (by) locally managed coping mechanisms planned within national frameworks for the reduction of vulnerability. . . ."

Internationally initiated and funded reconstruction must understand and recognise local contexts if they are not to inadvertently make worse the situation they set out to improve. Or is it already too late?

REFERENCES

Carter, W: "A Report on Cyclone Isaac". UNDRO. April 1982.

Eaton, Keith J: "Founga Langa Ke Ne Matu'uake Matangi". (How to make your building withstand strong winds). BRE March 1982(a).

Eaton, Keith J: "Cyclone Isaac Relief Housing, Tonga". (Extracts from BRE Reports) Building Research Establishment. 1982(b).

Eaton, Keith; Reardon, G: "Cyclone Housing in Tonga". Building Research Establishment. 1985.

Lewis, James: "Mitigation and preparedness for natural disaster in the Kingdom of Tonga". Ministry of Overseas Development. 1978.

Lewis, James: "Volcano in Tonga". Journal of Administration Overseas Vol XVIII, No 2. ODM/HMSO. 1979.

Lewis, James: "Some perspectives on natural disaster vulnerability in Tonga". Pacific Viewpoint, Vol 22, No 2. Victoria University of Wellington. 1981.

Lewis, James: "The Long-term Implications of Hurricane Isaac (March 1982): Project identification and human settlement planning strategy for natural disaster mitigation". Mission Report. May-June 1983.

Lewis, James: "Some preconditions of vulnerability to disasters". Commonwealth Science Council Expert Group on Disaster Management, Commonwealth Secretariat. 1988.

Rogers, Garth (Ed): "The fire has jumped: Eyewitness accounts of the eruption and evacuation of Niuafo'ou, Tonga". Institute of Pacific Studies, University of the South Pacific. 1986.

UNDP: "Assistance to Tonga: Report of a review mission to Tonga". May 1983. UNDP Resident Representative, Suva, Fiji. May 1983.