

**Traditional land ownership patterns,
vulnerabilities and resilience in Cape Verde
and Papua New Guinea: consequences for
disaster mitigation strategies.**

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With special thanks to my colleagues in Cape Verde and Papua New Guinea, especially:



Jose Antonio Fonseca, Chadas Caldeiras, Fogo, Cape Verde (local seismic network warden for IST-Lisbon)



Jason Elemunop, Jonathon Kuduon (Geological Survey of Papua New Guinea) and **Noel Bandy** (PNG University of Technology, Lae)

Different patterns of land use and land ownership are critical factors affecting knowledge of, and responses to, disasters in different societies

- 🌐 In Western (and many other societies) land and property are:
 - ⚡ Owned individually or by nuclear families
 - ⚡ Inheritable within families
 - ⚡ Transferable by sale (or marriage)
- 🌐 Individuals and (nuclear) families have no title or access to land and property they do not own (“All or Nothing” principle of ownership)
- 🌐 Ownership a legal concept: land and property are registered by the state

Individual (“All or Nothing”) land ownership and localized hazards

- 🌍 Local hazard zonations are controversial in Western and Westernized societies
- 🌍 Affected individuals can lose (almost) all land and property
- 🌍 Examples:
 - ✓ River flood plains in UK and Europe
 - ✓ Tsunami inundation zones in India and Sri Lanka
 - ✓ Landslide hazard zones
 - ✓ Coastal erosion hazard zones
- 🌍 **Other societies have other land ownership and land use patterns, and will therefore respond differently to hazards (especially localized hazards)**

Customary (“Kastom”) land ownership in Papua New Guinea - a generalized overview

- 🌐 Land is **owned collectively** by villages or tribes
- 🌐 Land is **NOT transferable or mortgageable** (despite legislative efforts to the contrary)
- 🌐 Land ownership by village or tribe
 - ⚡ **claimed by clearance of jungle**
 - ⚡ **traditionally established by fighting**
 - ⚡ **legitimized by length of period of occupation**
- 🌐 **No central land registry or legal title to land**



Land disputes between (and sometimes within) villages are the commonest cause of violence in Papua New Guinea

- Relations between adjacent villages are soured by **land disputes** at ill-defined borders
- Good relations between villages are cemented by **exchanges** (kina shells, food, pigs) and **intermarriage**
 - Exchanges establish obligations of assistance in difficult times
 - When villages disintegrate, survivors join villages to which they are linked by marriage

Guns for tribal warfare ...



Tongai Kupaka warriors pictured yesterday morning displaying their weapons — two SLRs and an M16 rifle — which they use to guard their land in Aviamp near Mt Hagen. The tribe split into two factions a week ago and fought each other following a land dispute. A youth was shot dead, thousands of kina worth of coffee trees, pigs, and garden crops were damaged, and more than 40 houses were burnt in the fight. One of the factions fled after the fight. The gunmen (above) gave two weeks to the fleeing faction to return and fight them to decide the rightful ownership of the disputed land. The situation is still tense. There is no police presence in the area. — Words and pic by JOHNNY POYA

Front-page report in *The National* newspaper, 10th November 2004

Traditional land use in Papua New Guinea (some more generalizations)

- Within village lands, shifting slash-and-burn agriculture is regulated by village leaders (elders (“*lapuns*”) and chief (“Big Man”))
- Village leaders direct where families farm and where they move their gardens when land is exhausted
- Individual villagers have access to village resources as permitted / directed by village leaders in exchange for unlimited obligations
- Villagers live centrally in houses that may be ***moved within village lands***



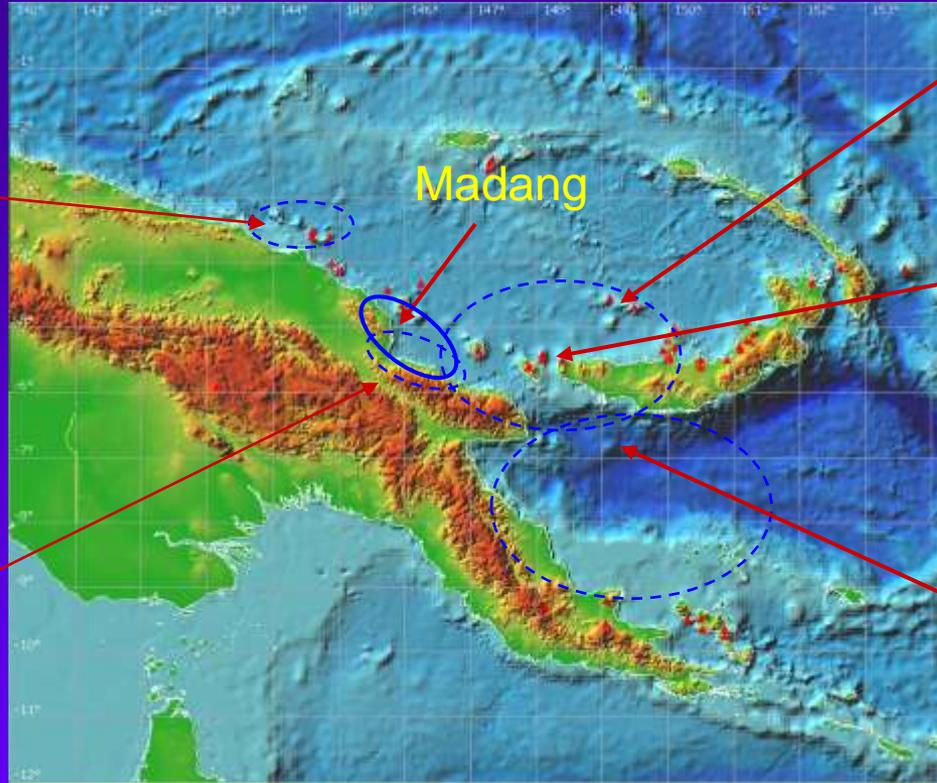
Oral traditions and legitimization of customary land ownership in PNG

- 🌐 Legitimization of customary land is by **longevity of occupation**
- 🌐 Longevity of occupation is established through **preservation of oral traditions** (normally passed from generation to generation by the *lapuns*)
- 🌐 Traditions related to the land include traditions of **hazardous geological events** (earthquakes, volcanic eruptions, tsunamis)
- 🌐 Geochronological dating establishes that some traditions are many centuries old
- 🌐 **Traditions preserve and promote hazard awareness**



Oral traditions of tsunamis and reef uplift in the Madang area relate to coral boulder deposits and raised reefs C-14 dated as 500-600 years old (possibly to raised reefs ~3000 years old) --- *Day et al., in prep.*

Areas with traditional knowledge and/or recent experience of tsunamis in northern and eastern Papua New Guinea before the 1930 Ninigo Islands tsunami



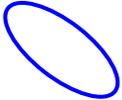
Narage landslide tsunami (c. 1890)

Ritter Island volcano collapse tsunami (1888)

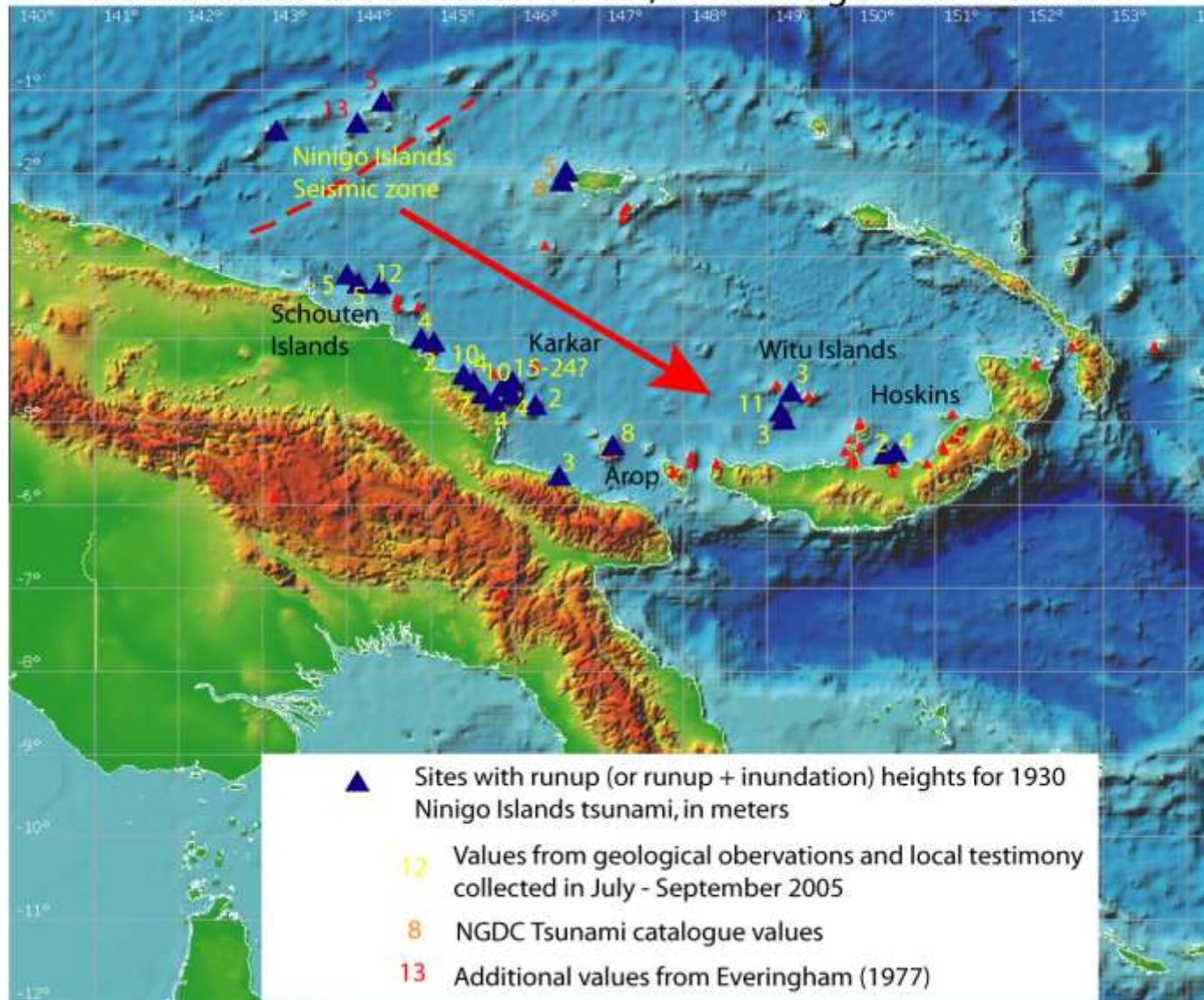
New Britain trench 1895 (Everingham 1977)

Schouten Is. (e'quake, c. 1850?)

Garagassi (e'quake + coastal landslide, c. 1860)

-  Area of Yomba tradition and ~15th Century tsunami deposits
-  Areas with traditions of 19th Century tsunamis

New data for the December 24th, 1930 Ninigo Islands tsunami



Mortality rate in the Ninigo Islands tsunami: 0.1 - 1%

Mortality rate in Thailand from the 2004 tsunami: ~10%

An example of lives saved in the Ninigo Islands tsunami: Children on the reef, Mundua, Witu Islands

Michael Wambiruai of Silenge:

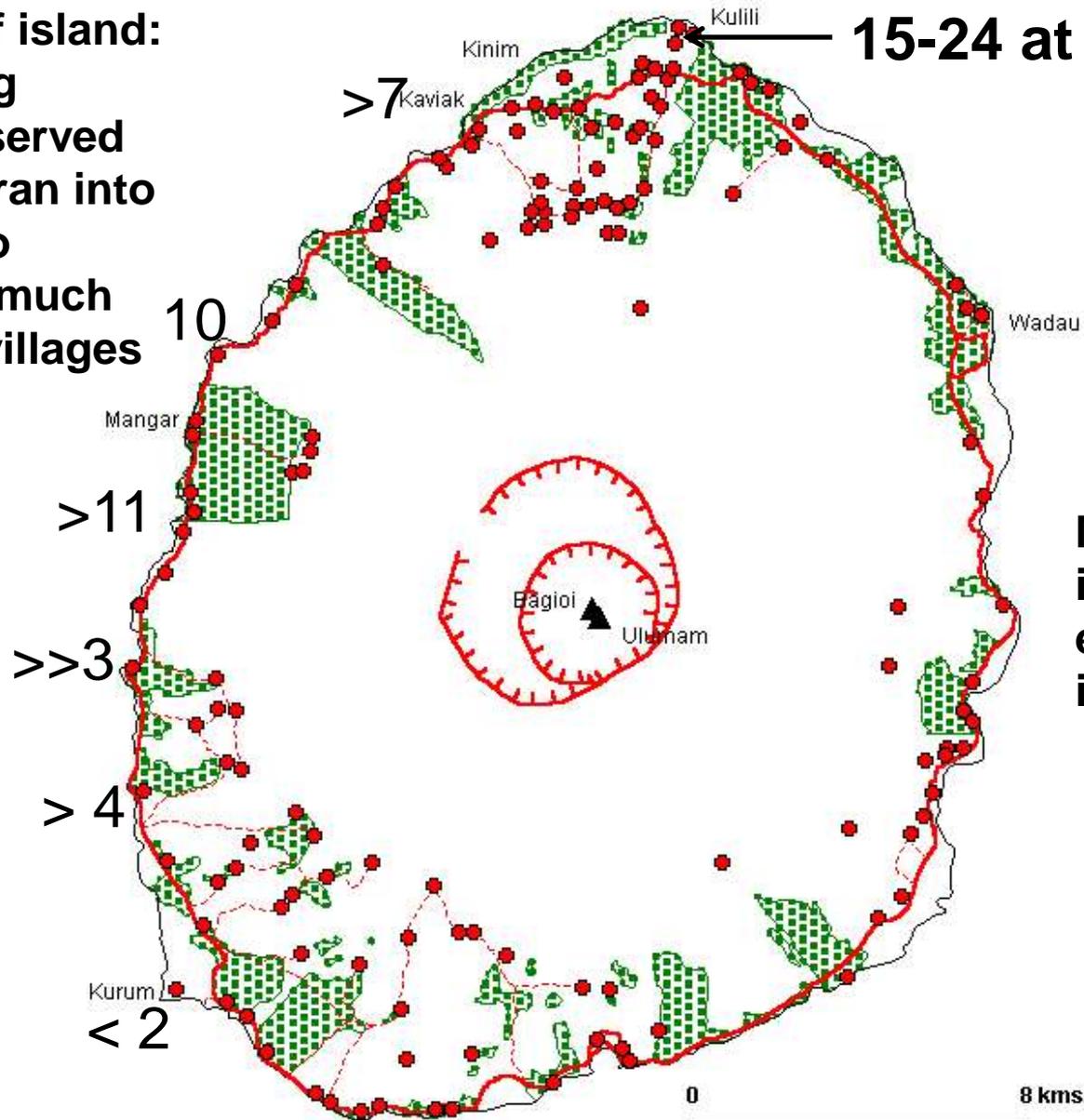
He and his sisters went to play on the reef when the sea went out, but their mother and the old people shouted and ran to fetch them, and then took them up on the hill before the sea came in and flooded the village. This happened about mid - day.



Impact of the 1930 Ninigo Islands tsunami on Karkar: runup heights in meters

West side of island:
Approaching tsunami observed
and people ran into the bush: no
deaths, but much
damage to villages

15-24 at Deltigu village



Minimal
inundation on
east side of
island



Traditional land use and disaster response: movement of Deltigu village, Karkar, in response to the 1930 Ninigo Islands tsunami

- 🌐 Tsunami runup at old coastal site of village = 15 - 24 meters
- 🌐 Village partly destroyed by tsunami, although inhabitants had run uphill on seeing approaching waves
- 🌐 Village elders decided to rebuild ~ 2 km inland, near upslope limit of village lands
- 🌐 Why didn't other coastal villages move their houses inland?
- 🌐 What keeps village housing at or near the shoreline?



The main problem caused by the movement of Deltigu village, and its solution by the village

- Coastal springs are the prime source of fresh water for drinking and washing (including washing of clothes)
- Village maintains clear, straight “Roman Road” path to shore, protected by hedges and adjacent commercial plantations
- Hypothesis: Village women needed to be protected from neighbouring villages as they go to and from the shore
- Digging of wells and installation of pumps would be a more general solution, allowing village houses to be moved out of tsunami inundation zones
- Successful hazard mitigation solutions need to take account of the concerns and priorities of the affected population
- Those concerns may have to be inferred by outsiders



Shoreline springs are key water sources and washing places for all coastal villages on Karkar



Other villages were considering moving in 2005

- During 2005 fieldwork, we used discussions with villagers as an opportunity for tsunami education
- Some village leaders asked our advice on whether to move
 - ⚡ Motivated by reports of 1998 Sissano, 2004 Sumatra tsunamis
 - ⚡ Mainly thinking in terms of moving houses within village lands
 - ⚡ Motivations may have been complex (e.g. hazards may have been brought into debates on economic migration)
- Were they asking our (my) advice because of history of migration in response to instructions from colonial officials?



Buson village, Karkar Island



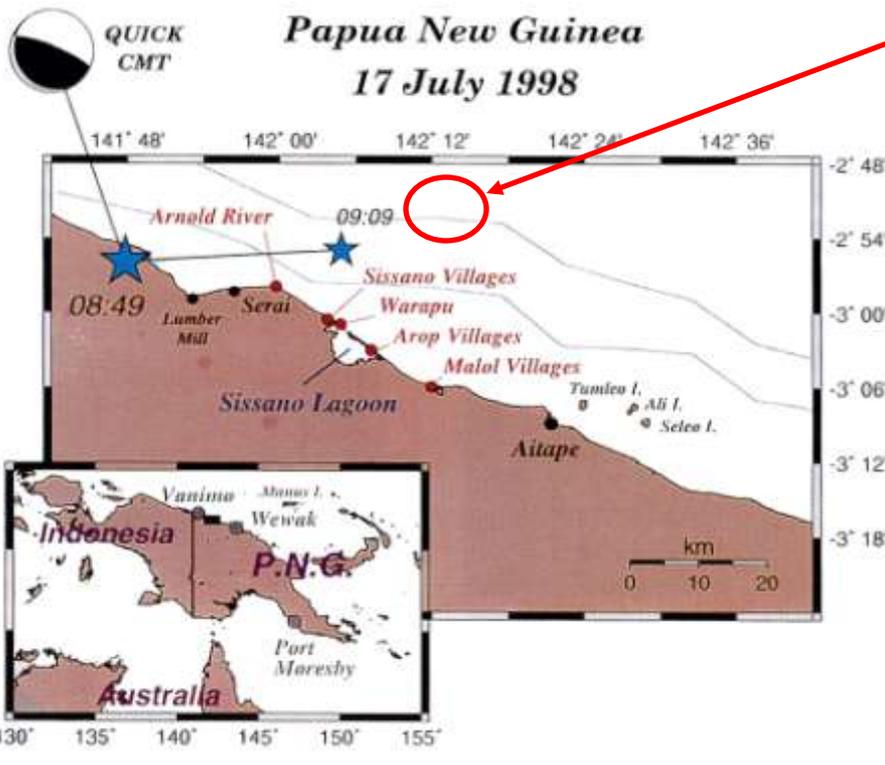
Wei Island



Seb village, Saidor

The exception (?): Sissano 1998

Map and Photo
courtesy Dave
Tappin, © NERC



Landslide
area



★ Earthquake and aftershock

Sissano Lagoon from the east

~2300 deaths in tsunami, mainly in Sissano, Warapu and Arop villages (15 km length of coastline)

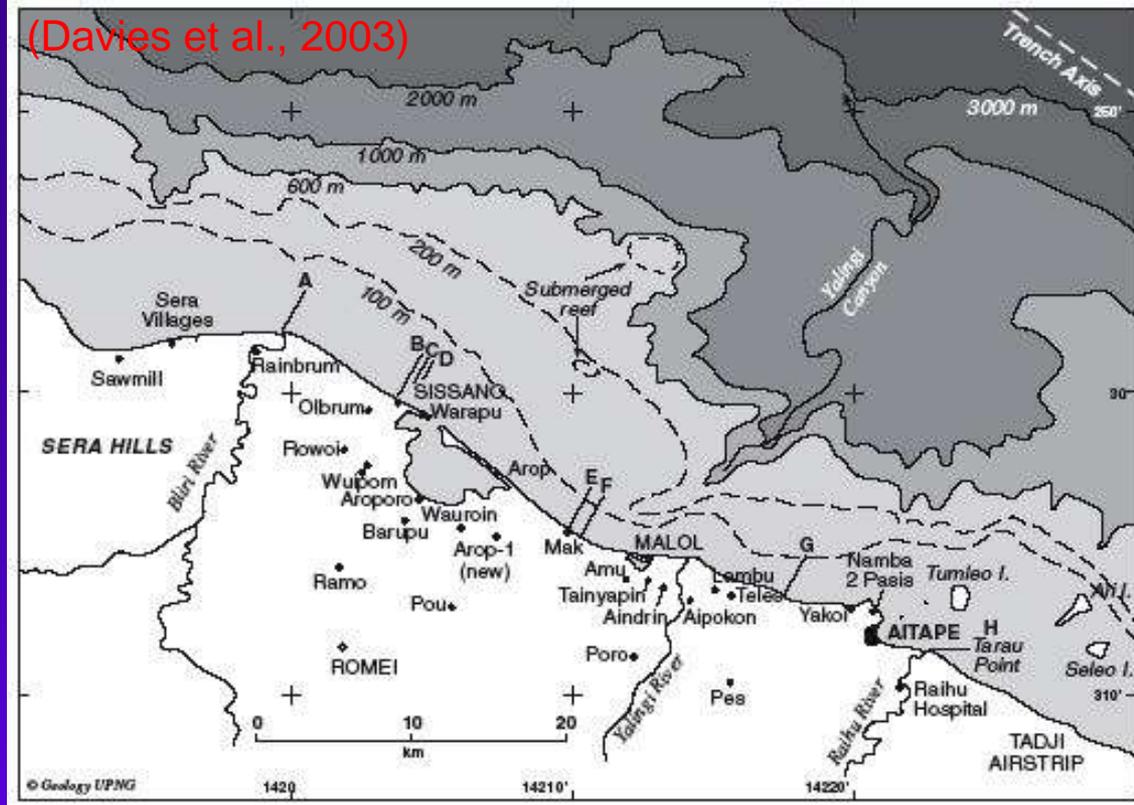
Who died in the Sissano tsunami?

>2000 deaths in the 3 main tribal groups affected by the tsunami:

Sissano

Warapu

Arop



Reports from missionaries Fr Parer & Fr Norbert (Mennis, 2003 & pers comm.):

Sissano: recently migrated to coast after inland territory swamped by subsidence and growth of lagoon

Warapu: migrated from Dutch New Guinea c. 1900; only moved to coast in 1949 when their initial settlement was abandoned (after church was burned down and several people killed)

Migrants lack local traditions and are especially vulnerable

Evacuation of Manam Island 2004: complete removal of people from their land in Papua New Guinea can be a catastrophic mitigation “solution”



Manam volcano erupting, 14th December 2004

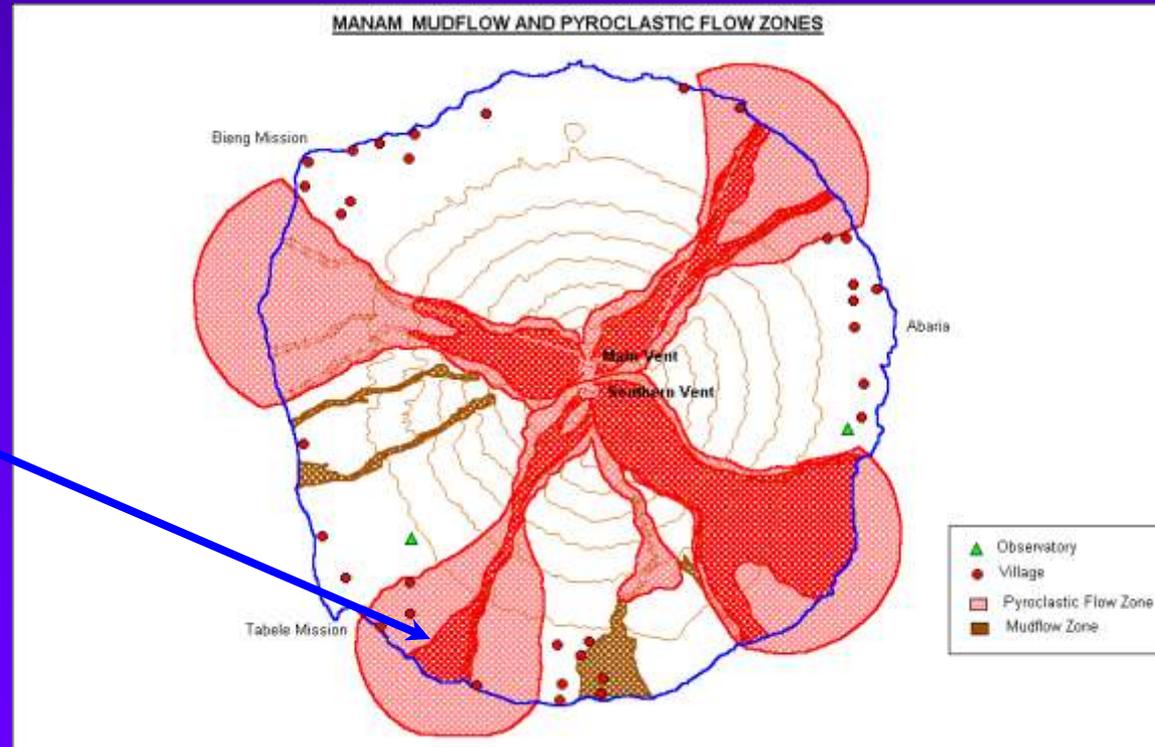
Evacuation of Manam: a solution that is worse than the problem?

- 🌐 Population of 12 000 moved to adjacent mainland in 2004
- 🌐 Settled in evacuee camps on commercial plantations on low-lying coastline
- 🌐 No land rights on mainland - no land, no work, no income
- 🌐 Social and medical problems (especially malaria)
- 🌐 Men return to Manam to gather from gardens (despite danger from repeated eruptions and mudflows) - at least 4 deaths reported since 2005



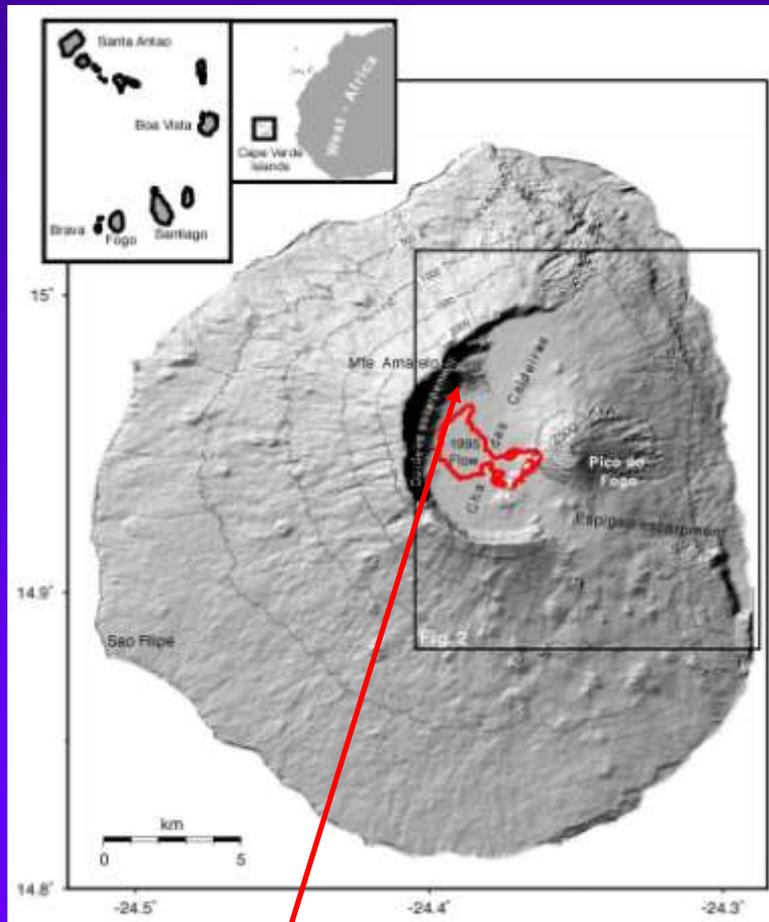
Would zoned resettlement be a better solution?

- 🌐 Zoned resettlement on Manam, coupled with better monitoring to give warning of major eruptions, might be a better solution (despite danger)



RVO hazard map of Manam

“Muito Obrigado, pero Nao Obrigado”: the failure of resettlement policy as a response to the 1995 eruption of Fogo, Cape Verde Islands



- Eruption April 2nd - May 26th 1995
- Strombolian activity at vent cut road early in eruption
- Population nearly all evacuated to camps in south and west of island
- Lava flows destroyed ~2/3 of best village fields, but almost no houses

Portela and Bangeira villages,
Cha das Caldeiras

Resettlement of the Cha villagers on the south side of Fogo? No thanks!

- 🌐 Cape Verde government (and GTZ aid agency) funded construction of resettlement housing estates on south side of island 1996-1997
- 🌐 **No land provided with houses, so no income**
 - ⚡ **South side of island is much drier than Cha - little work for hired labour**
- 🌐 Most residents of Cha moved back to Portela and Bangeira villages 1997 - 2002
- 🌐 Long fight to restore public services (school, clinic)
- 🌐 **National park** set up (2003) to increase income from tourism, **limit population growth in Cha**

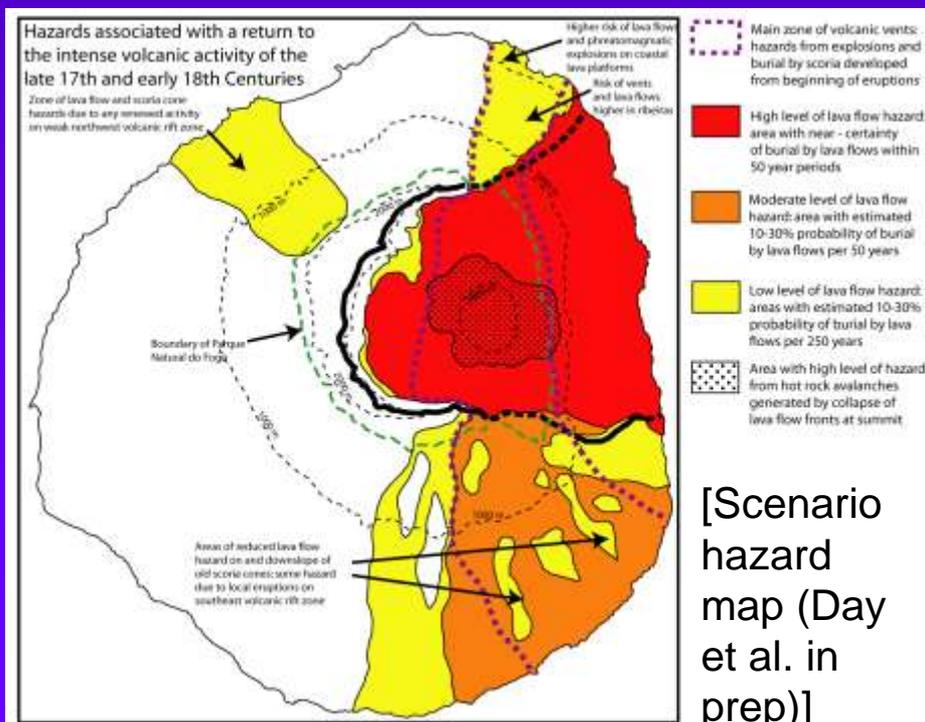


Land, Freedom and Anomalous Sex Ratios in Cape Verde

- Present population largely descended from slaves (and slave-owners)
- Export of male slaves led to high female/male ratio in adult population
- On Fogo, slave plantations largely in west of island
- Eastern Fogo affected by frequent, intense eruptions up to mid - 18th Century
- Slaves freed in 1840s, dispersed into unoccupied lands
- Eastern Fogo and Cha das Caldeiras occupied from 1850s onwards
- Many young men leave to work abroad (19th Century, to present) resulting in persistently high female/male ratio amongst young adults



Restored early 19th Century Sobrado, Sao Filipe



Land, Family and Obligation in Cape Verde



- 🌐 Rural land owned by families (after abandonment and breakup of slave estates)
- 🌐 All members of extended families have some interest in family lands
 - ⚡ Land transfer or sale is difficult
 - ⚡ Extended families have interests in multiple plots of land in different villages
- 🌐 High female / male ratio associated with persistence of polygamy (for men) and serial monogamy (for women) - some men have many children by several women
 - ⚡ Extended families are *very* extended (e.g. the >1000 descendants of the Duc de Montrond)



Extended families in Cape Verde provide support network in event of hardship or natural disaster

- In 1995, livestock from Cha das Caldeiras was evacuated to lands owned by relatives of villagers outside Cha
- Application of the concept of distributed interest in lands in different villages, associated with complex extended families
- Based on concept of mutual obligations within families
- **Possession of land and income is critical to status within family**

Attitudes of inhabitants of Cha to volcanic risk (quotes from talk by Manuel Teixeira*, MIA-VITA workshop, Fogo, June 2009)

[* Maternal half-brother of Jose Antonio and son of Sr. Antonio]

“It is better to have something under risk than to have absolutely nothing without risk of danger” - Vital

“If I am destined to die of hunger in the land of other people without risk of danger I am better to die in the fire of the volcano of my own land” - Ze de Saty



“To live with the volcano at one’s feet is to live at the feet of God, because he commands it and he also protects them, therefore one must not have fear from knowing the risks” - Sr. Antonio Teixeira

Traditional land ownership patterns: an unrecognized cultural capacity in disaster mitigation?

- 🌐 Traditional land ownership patterns reflect culture and economy
 - ✦ **Collective land ownership in PNG enables slash-and-burn shifting agriculture**
 - ✦ **Multiple interests in land in different villages reflects complex family structure in Cape Verde**
- 🌐 But, a side effect of these land ownership patterns is to increase resilience of communities in face of localized hazards (tsunamis, floods, lava flows)
 - ✦ **Collective / distributed land ownership has little effect in face of larger-scale disasters (e.g. Manam)**
- 🌐 Replacement of traditional land ownership with Western-style patterns may have unintended detrimental effects upon communities' capacities to mitigate effects of natural hazards
 - ✦ **Migrant communities lack local traditional knowledge of hazards and are especially vulnerable (e.g. Sissano)**

Who participates in participatory decision-making?

Participatory decision-making seeks to devolve decisions about risk mitigation

How far can decision-making be devolved in traditional societies?

At village level, decisions often depend on a minority of individuals:

- ✦ **Lapuns and Big Men in most rural communities in Papua New Guinea**
- ✦ **Village leaders and heads of families in rural Cape Verde**

Are these individuals representative of their communities?



Scientists and other Disaster Risk Reduction Professionals have Traditions, Too

- The motives of professionals are commonly obscure and suspicious to members of traditional societies
- The problem is especially acute where there are **land disputes** between traditional communities and outsiders (e.g. over mining rights)
- Professionals working in traditional societies and engaging in participatory decision-making therefore **need to understand and explain their own motives**
- Explanations in terms of the **scientists' and professionals' cultural (tribal) heritage can be the most successful**

Beowulf meets the *Wantoks*



Road accidents are reported to be the second most common cause of inter-village violence in PNG (note: there is no such thing as an accident in traditional Papua New Guinean culture)