

Personal Reflections on the Effect of the 1997 Drought and Frost in the Highlands of Central Province

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Abstract

In 1997, temporary changes associated with the El Niño climatic disruption caused one of the most prolonged and severe droughts in PNG in over 100 years. An assessment of the impact of the drought and frosts in the highlands of Central Province was carried out from 3 to 7 December 1997. This paper describes the impact on village food and water supplies, health of rural villagers, education and health institutions, as well as cash income and effects on bushfires in the Goilala area. The responses of villagers to the drought and frosts are also noted.

MUCH of PNG was severely affected by a major drought and a series of frosts associated with the El Niño weather pattern in 1997–98. El Niño has become a household word and refers to a number of complex changes that occur in oceanic and atmospheric circulation across the Pacific region. In an El Niño event, the eastern Pacific Ocean becomes warmer than the western (PNG) side, which is the reverse of the normal situation (Allen and Bourke 1997a). In 1997, the El Niño event was particularly severe. Rather than warm, moist air rising over PNG, cool dry air was descending, resulting in lesser cloud cover and lower rainfall (Allen and Bourke 1997a). The 1997–98 drought was more severe than any recorded previously and resulted in extensive bushfires. The drought was much more severe and had wider impacts than others in recent decades. It was comparable in severity with events in 1914 and 1941, and possibly more severe and widespread than those

droughts (Bourke 2000). The greatest impact of the 1997 drought and associated frosts was on the subsistence food supply and villagers' health.

The drought commenced as early as March 1997 in some locations and became widespread throughout PNG by July of that year. Frosts were also reported in many highland locations (above 2200 metres above sea level) in parts of Enga, Southern Highlands, Western Highlands and Central provinces (Allen and Bourke 1997ab). As with El Niño events over the past 40 years, intermontane basins and valleys above 2200 metres were most severely affected by repeated frosts (Bourke 2000).

A few areas in the Goilala District received useful rain in late November. One area, Woitape, received 140 millimetres of rain in the weeks before my visit. However, most of the area were still experiencing drought conditions in early December 1997.

Assessments of the Impact

In late November and early December 1997, Heai Hoko and I assessed the situation in inland and coastal Central Province. (Another 18 teams visited other

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parts of the country. Team members came from the Department of Agriculture and Livestock (DAL), provincial governments, Ok Tedi Mining Ltd., the Cocoa and Coconut Extension Agency and nongovernment organisations including CARE Australia. The teams included provincially-based staff and specialists in agriculture, water and health.) After briefing on the appraisal techniques and locations to be visited, fieldwork in the Goilala District was carried out over five days. Here I give a summary of what I observed in the areas visited in the mountainous Goilala District.

Areas visited

Ononge

On my visit to Ononge, I was accompanied by a Goilala man, James Gitai, who works for DAL in Port Moresby. His knowledge of the area proved invaluable. We were informed of food shortages and told how people were living on *karuka* (pandanus nuts). Whole families had been living on *karuka* from the bush since June 1997. Water was available but required half a day to fetch it from the Hamba River as all nearby drinking water from creeks had dried up. It was suggested that water could be pumped from Hamba River to irrigate gardens during the dry season.

The incidence of diarrhoea, dysentery, pneumonia and other respiratory problems had increased due to lack of water (Table 1). Deaths were also reported from anaemia, dysentery and typhoid since the drought commenced in June 1997 (Table 2). Lactating mothers were not breastfeeding well due to low production of milk, resulting in malnourishment of children. One death was also reported after a man fell from a pandanus tree while looking for food. There was an urgent

need for planting materials such as cabbage, carrots, lettuce, broccoli, beans and peas, and English potato.

Woitape

The food situation was poor at Woitape. A few crops such the vegetable *pitpit* (*Setaria palmifolia*) and sugarcane were available; however, staples such as sweet potato were not. Delays in relief supplies resulted in people resorting to *karuka* and other famine foods.

Woitape received 140 millimetres of rainfall in the weeks before the visit. Planting materials were needed to capitalise on the recent rain; sweet potato, corn, pumpkin, beans, lettuces and carrots were among crop planting materials requested. Water supply was satisfactory, provided it was boiled.

Table 1. Incidence of diseases at Ononge, Central Province, PNG, during the 1997–98 drought.

Disease	Reported cases
Cold and influenza	74
Pneumonia (< 5 years of age)	95
Pneumonia (> 5 years of age)	83
Other respiratory diseases (e.g. asthma)	36
Diarrhoea (< 5 years of age)	11
Diarrhoea (> 5 years of age)	12
Simple malaria	145
Severe malaria	1
Anaemia	1
Malnutrition	1

Source: Ononge Catholic Health Centre

Table 2. Number of deaths reported at Ononge, Central Province, PNG, July–December 1997.

Month	No. of deaths	Child/adult	Cause of death				
			Anaemia	Dysentery	Typhoid	Pneumonia	Other causes
July	1	Adult	1				
September	2	Adults	1	1			
October	2	1 Adult, 1 Child			2		
November	13	Not recorded		6	6	1	
December	1	Adult					1
Total	19		2	7	8	1	1

Source: Ononge Catholic Health Centre

Fane/Auga

In Fane/Auga, a community of 7000 people was living on *karuka* and other famine foods as gardens dried up in the drought. People were reported to be camping at a site where food and water was present. The school was closed due to the high incidence of diarrhoea resulting from water shortages and possible contamination of water. People migrated to the Tolumkuma gold mine from the areas around Fane (a walk of 3–4 days) in the hope of obtaining food and cash from *wantoks* (friends and relatives) at the mine site. There were complaints about the mine's failure to offer assistance during the drought.

Water was readily available but transport of water to homes was difficult. The United Nations Children's Fund (UNICEF) was reported to have brought materials for a water supply; however the local villagers had not been able to assist in building it. Information from the local clinic showed that diarrhoea and other gastric disorders were increasing (Table 3).

The local priest expressed concerns that men were buying beer while women and children had no food. The people were in urgent need of food aid, medical assistance and planting materials.

Large tracts of forests and a lot of homes around the communities of Garima and Kalaibe were burnt as a result of the drought. Several of the villagers requested government compensation for their losses. One villager reported that his loss amounted to 500 PNG kina (PGK)¹ and inquired about government compensation. It was explained that the assessment

Table 3. Incidence of diseases at Fane, Central Province, PNG, October–November 1997.

Disease	Reported cases
Cold and influenza	0
Pneumonia (< 5years of age)	0
Pneumonia (> 5years of age)	0
Other respiratory diseases (e.g. asthma)	0
Diarrhoea (< 5years of age)	42
Diarrhoea (> 5years of age)	18
Malaria	166
Dysentery	5
Anaemia	0
Malnutrition	16

Source: Fane Catholic Health Centre

team was there to report on the effects of the drought and frost, not to pay compensation claims. Local priests had earlier reported on the situation in the area to the disaster relief officers in Port Moresby.

Kosipe

Kosipe experienced continuous frosts from April to October 1997, causing the vegetation to dry up. With the onset of the drought, the whole area became a fire hazard zone. People were living on *karuka* as the frosts and drought destroyed gardens.

In late October to early November 1997, the situation in Kosipe worsened when a bush fire destroyed a total of 19 villages including the Catholic Station. People had to deal with the issue of shelter as well as food shortages.

Of all the places visited, Kosipe was in the most desperate situation. People could not build houses or shelters because building materials (pandanus) were destroyed in the fire. Days were hot and dry, nights very cold. People began migrating to Woitape, Tolumkuma, Port Moresby and other places where food and shelter was thought to be available.

Since the fire, people had lived on relief supplies. The final food relief supply was dropped on 14 November 1997 and its impact was quickly felt in the community. Health conditions of starving children improved significantly. Urgent medical assistance was required to address the high incidence of stomach disorders, influenza and pneumonia. People expressed the need to rebuild the aidpost and water-pump to help with irrigation of food crops. Other urgent needs included cooking utensils, clothes, blankets, tents, farming implements, water containers, fencing materials, and planting materials (seeds, cuttings, suckers, etc.).

Social problems were caused by distribution of relief supplies. The first relief supply was dropped at Kosipe, the second at Woitape. Concerns were raised by villagers that other villagers would steal the supplies.

Kerau

The situation at Kerau was similar to that at Kosipe. People were living on *karuka* as gardens had failed. The gathered *karuka* nut kernels were becoming smaller and smaller. In the first week of November 1997, 1500 kilograms (kg) of rice (60 × 25-kg bags) was given to the people of Kerau; however, this was not sufficient. Concerns were also raised when 50 bags of rice were sold after they were

¹ In 1997, 1 PGK = approx. US\$0.70 (A\$0.94).

given as relief food. People were not happy that further relief supplies were dropped at Tapini, a six-hour walk away.

The water supply was low and was reducing fast. All nearby creeks had dried up and drinking water had to be fetched from another source, an hour's walk away. Poor water quality and a diet of *karuka* also increased the incidence of diarrhoea and other stomach disorders. Major diseases could not be treated as the aidpost was not staffed.

The villages of Elava, Kirivi, Ilai, Gane, Malava and Lamanaipi were burnt by bushfires, causing an exodus of people to Port Moresby via Tapini. Tents, water containers, cooking utensils, clothes, blankets, planting materials and medical assistance were urgently needed.

Koiloa

When we arrived, Koiloa, a village of 200 people, had been living on relief supplies, delivered six weeks earlier. When these ran out, people survived on *karuka* and breadfruit, resulting in a high frequency of diarrhoea and stomach problems. Gardens were destroyed in the drought, resulting in migration to Port Moresby.

Water was available but was at least an hour's walk from the village. The younger children and elderly people from each household were often too weak to carry water home from the rivers and creeks. Fire also destroyed three houses in Koiloa, leaving people homeless and very vulnerable to colds, influenza and pneumonia. The incidence of other diseases also increased (Table 4).

Upper Kunimaipa

In the Upper Kunimaipa area, assessments were made at the villages of Hoeta (Olivi) and Gagave.

Table 4. Incidence of diseases at Koiloa, Central Province, PNG, during the 1997–98 drought.

Disease	Reported cases
Diarrhoea	25
Pneumonia	40
Malaria	20
Influenza	53

Source: figures supplied by a village leader

Hoeta village. In Hoeta village, all food gardens were destroyed in the drought resulting in people turning to *karuka* as the source of food. When this was exhausted, people had to live on wild yam, despite its bitter taste and difficult preparation. People also depended to a lesser degree on ferns, breadfruit and the leaves of *kumu mosong* (*Ficus copiosa*). Villagers predicted that, within two months, all food supplies would run out. Betel nut trees, a main source of income, were also lost in the drought.

All nearby streams were dried up in the drought and the nearest water source (Makorak River) was a three-hour walk away. The stronger members of the family collected an average of five litres of water per household daily. Bigger families needed more water than smaller families. With the prolonged drought, the water level dropped drastically, so that it took up to an hour to collect two litres of water. Children were assisting less and less with household chores due to weakness from lack of food.

The general decline and deterioration in the health of children and the elderly was obvious. Seven cases of malaria and one case of tuberculosis were reported by the villagers, although the true figure may be much higher.

Many people from Hoeta village moved to Port Moresby via Tapini in search of food. Six families were reported to have migrated to Port Moresby. Bigger families were finding it difficult to travel to Tapini and Port Moresby due to lack of food to feed relatives along the way and slow movement. Concerns were expressed that the government had offered no assistance since the drought started. Villagers indicated that relief supplies should be dropped at a central location like Hoeta for distribution to nearby areas. People were in urgent need of medical and food assistance. Planting materials requested included sweet potato, potato, corn, cucumber, pumpkin, bean, cabbage, carrot, peanut, *aibika*, banana, sugarcane, taro and yam.

Gagave village. Gagave village, with a population of approximately 200 people, had received no food aid since the drought started. For almost a year people had been surviving on breadfruit, ferns, and *karuka*, after gardens were destroyed. The size of mature pandanus nuts was becoming smaller as the drought continued. Villagers lost their entire income source when live-stock (mainly pigs) died through starvation.

People were walking long distances looking for food. A total of 25 people had left for Port Moresby via Tapini (a two-day walk) in search of food and many more planned to leave should relief supplies fail to

arrive. The villagers wanted their relief supplies to be dropped at a central point for easy distribution rather than at Tapini, where risk of theft was high.

Water collection had become a hard but essential daily chore for survival. All nearby creeks had dried up. The nearest source of water was Ngotngot River, about 2–3 hours' walk away. The diet of *karuka* gave rise to a high incidence of diarrhoea and other stomach complaints. Other diseases were also increasing and, since June, five deaths were reported from starvation. The general status of health was deteriorating rapidly, particularly in malnourished children and the elderly. Urgent medical and food assistance was needed. The drought also had a spiritual effect on the people, who said the recent blessing of four days of rain was God answering their prayers. They claimed that to have survived so far was a miracle in itself. In a nearby village of Gumizi, the whole village was burnt, including Division of Primary Industry houses. Urgent relief supplies, including tents, food, water, medical supplies, clothes and cooking utensils, were needed.

Lower Kunimaipa

Kamulai Catholic Mission. At Kamulai Catholic Mission, a Belgian priest reported that in 40 years at Kamulai he had not seen such a devastating drought. There had only been four days of rain, amounting to 24 millimetres, since the start of the drought. Food was in short supply from May and people were surviving on *karuka*, of which very little was left, and that was very dry. Although no actual figures were given, the incidence of diarrhoea, gastroenteritis and other stomach disorders increased significantly. A lot of people have migrated to Port Moresby in search of food. All food markets were closed, as there was nothing to sell. Most of the pigs died of starvation and cash crops of coffee were neglected.

Relief supplies were dropped at Tapini, but were claimed to be insufficient. Two 100-kg rice bags were delivered to Tapini but most was then stolen. The Guari people were alleged to have stolen most of the food supplies after threatening the officials with guns; the police were investigating the matter. Concerns were raised that new supplies had been delivered to Tapini but had not been distributed, while people were starving in nearby areas. Urgent relief assistance was needed including medicine, food, clothes, blankets and planting materials.

Conclusion

The drought and associated frosts had a major impact in the Goilala area and much of PNG. The most severe effect was on the subsistence food supply. All the villages visited in Goilala District were surviving on either relief food supplies or famine food. The impact of the drought and frosts was greatest in the most remote locations where the effects were compounded by poverty and lack of access to government assistance.

The drought resulted in significant water problems. Water collection was a hard but essential daily chore for survival. The majority of villagers in Goilala District were obtaining their drinking water from sources other than their usual ones.

At first glance, the general decline and deterioration in the health of villagers was evident, particularly in the younger children and the elderly. In some places, nursing mothers reported a decline in the quality and quantity of breastmilk. Incidence of illness and death increased.

The drought resulted in extensive bush fires causing loss of homes, for example, 19 villages were burnt in Kosipe. Income was lost through neglect of coffee trees and loss of betel nut trees and pigs. All community schools were closed. Students lacked stamina and needed to spend time looking for food. Health institutions closed because of water shortage and lack of staff and medicine. Due to loss of gardens and livestock, many people camped at sites where famine food was available, or migrated to Port Moresby and the Tolukuma gold mine.

Concerns over delays in distribution of relief supplies were reported. Other social problems caused by the drought included the selling of relief supplies to villagers, the stealing of relief supplies at Tapini, and men buying beer while children and women were starving. The drought also brought renewed faith among Christians in some of these rural communities.

The 1997 drought had a major impact in the mountainous part of Central Province. The food supply was limited and people survived on emergency foods, especially *karuka*. Water supplies dried up and many people had to walk long distances to obtain water. There were many reports of increased health problems and some of an increased death rate. Some people responded by migrating to Port Moresby and to other locations. Some problems with the effective delivery of food relief occurred, often because of social factors.

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