moves northward over the western Pacific Ocean and South East Asia during this season. Disruption to these normal seasonal atmospheric circulations resulted in abnormal weather patterns over the maritime continent during 1997. Firstly, the deep tropical convection over the central equatorial Pacific Ocean and the changed cross-Pacific Ocean sea surface temperature gradient altered the atmospheric surface pressure patterns, with generally higher pressure over the maritime continent region. Secondly, the deep atmospheric convection was located over the central Pacific Ocean and tropical storms and cyclones tended to form further east than usual. The impact of the El Niño on the seasonal climate circulation can be seen in the montage of climate indicators in Figure II.44.

Above normal sea level pressure persisted over the maritime continent (Figure II.44a) and the anomaly extended

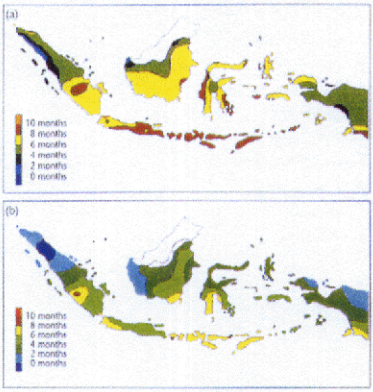


*Figure II.45 Maps of duration in months during 1997 when consecutive monthly rainfall was a) less than 150 mm per month (defining the "dry season"); and b) less than 50 mm per month.* (MGA, Indonesia)

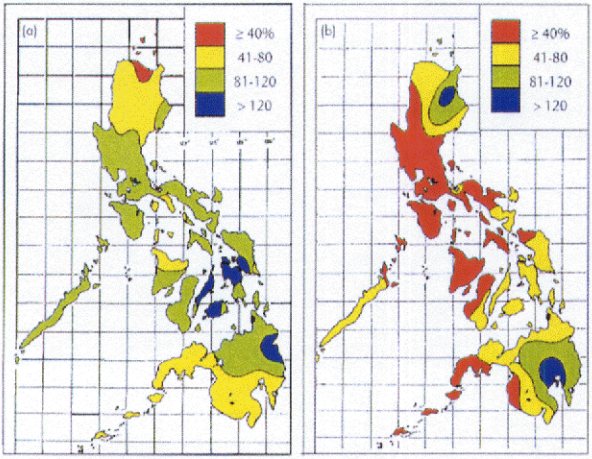


*Figure II.46 Cumulative rainfall over the Philippines for a) July to September 1997, and b) October to December 1997, as a percentage of normal for each season.* (PAGASA, Philippines)

Drought was a prominent issue for Papua New Guinea during the second half of 1997 and early 1998. Low rainfall is usual for the first half of the calendar year but by mid-1997 the effects of below normal rainfall had become a concern. Frosts in the highlands accompanied the dry weather and, as forests dried, large-scale wildfires caused further damage. Farmers readying gardens for the next crop were reported to have started many fires.

The developing impact of the below normal rainfall was for a deterioration in living conditions as food crops wasted or failed and as water quality and supplies declined. The lack of water disrupted production at two of Papua New Guinea's major mines. By the end of 1997 the decline in export revenue from mining added to downward pressure on the Papua New Guinea currency exchange rate. There were major disruptions to electricity production in the Port Moresby area and government operations were affected, mainly by disruptions to water and electricity supplies.

The key food crop for about 65 per cent of the population is sweet potato, with the dependency greatest in the highlands. Sweet potato is mainly grown under a continuous cultivation process and takes between five and 12 months to mature. The frosts and drought disrupted the crop cultivation and ensured that food shortages would ultimately occur. Sago is the staple food for a further 15 per cent of

from the Asian land mass to Australia. The equatorial low level winds are generally light and small changes can have significant impact on low level convergence and the location of convection.

The significant anomalies in the wind flow (Figure II.44b) are firstly, the increased strength of the easterly winds west of Sumatra and secondly, the tendency for strengthened southerly winds east of Papua New Guinea becoming westerly winds north of the equator. The pattern in the anomalies over the South China Sea and western Pacific Ocean is not strong but is consistent with a weaker than normal monsoon and reduced convergence of air over the maritime continent.

The computed positive anomalies of vertical velocity in the middle atmosphere