

COUNTRY REPORT

TUVALU

ENSO workshop 19-23 October 1999
Nadi, Fiji

Socio-Economic Situation

Tuvalu already has a number of organisations responsible for developing, managing and protecting a wide-range of structures and activities pertaining to the natural, socio-economic and cultural environment. This is the quality which has been encouraged and would be enhanced to cope with the climate-related impacts.

The socio-economic characteristics of contemporary Tuvalu include a mix of traditional and non-traditional features. Traditional kinship arrangements and strong linkages to one's home island are important elements of contemporary society and subsistence fisheries and agriculture play an important role. Together with these, though, a non-traditional governmental system exists at the national level and a mixed traditional and non-traditional governmental system exists at Falekaupule both have an important role locally. Tuvaluans participate to a variety of degrees in the global market economy and a number of Tuvaluan people are involved, temporarily, in cash employment overseas.

The land-sea interface provides a baseline for the protection of Tuvalu's limited resources. Socio-economic and socio-cultural infrastructure (settlements, economic activities and government infrastructure) are located mainly on beaches and on reef flats no more than 3 metres above sea level. The threat of increasing sea level and climate variability poses a significant burden on the physical and socio-economic structures. Coastal protection is just as important as the adoption of practices that protect/prevent large-scale damage to the physical environment and the socio-economic infrastructure of Tuvalu in the long-term.

Tuvalu has got a National Disaster Preparedness Plan which can be updated regularly if required. The plan identifies the members of the National Disaster Committee (NDC) and their functions, identifies the members of Island Disaster Committees and their functions, dictates responsibilities of the secretary to Government being the chairman of NDC, and dictates responsibilities of the vice chairman, the secretary Works, Energy & Communication.

Under the emergency section of the plan the focus is only on tropical cyclones; such that categorised wind warnings are defined plus corresponding actions required to be undertaken by the following departments and ministries; Meteorology, Disaster, Police, Medical, Media, Red Cross, ministry for commerce & natural resources, ministry of finance.

Practically under any declared state of emergency the NDC is automatically in operation and a task force is established accordingly. From this point onwards the disaster is entirely monitored and managed by the task team. The team would report constantly to the Prime Minister's office whenever necessary.

Measures for coping with natural hazards, such as tropical cyclones and drought are being replaced through access initially to colonial government assistance (Brady, 1978) and more latterly foreign aid.

Natural Hazards

The natural hazards that occur in Tuvalu are tropical cyclones, sea level rising, inundation, drought, pest, tornado and downbursts.

Tropical Cyclones

Consequences of tropical cyclones are: very strong winds, very rough seas, storm surge, accelerated coastal erosion, disappearance of Tepukasavilivili, one of the islets of Funafuti, depletion of land/beaches, rehabilitation costs of one million Australian dollars for the three cyclones, Gavin, Hina and Keli in 1997.

Sea Level Rising

Sea Level Rise is a continuing threat to Tuvalu as many of the land area is only 2 metres above sea level. A little sea level rise in recent years is already disaster. These low-lying areas were under seawater at every spring tide. The rise of interface between seawater and fresh water lens due to sea level rise has made the freshwater lens thinner and has decreased the available amount of fresh water. An analysis of groundwater levels by Falkland (1999) suggested a high mixing of groundwater and underlying seawater. The spots that were tested were found brackish and there were no substantial freshwater lenses in Funafuti.

There is no uncertainty about the impact of climate change and sea level rise in Tuvalu because we are convinced by difficulties in traditional plantation of taro and pulaka, destruction of many other regular crops more frequent tropical cyclones, more severe drought [probably due to recent La Niña], alarming sea level height during spring tides, etc.

In fact until recently, nobody had woken up to the climate change and sea level issues. Tuvalu is facing the daunting prospect of being one of the

first countries to be submerged by climate change related sea level rise, in perhaps as few as 100 years.

Inundation

Erosion is very serious on Fogafale which is the main settlement on Funafuti. Evidence of erosion resulted in the removal of coconut trees and pandanus trees along the lands adjacent to the lagoon shores. Sea wall protection in the form of gabion basket has been destroyed. Further attempts on sea wall using concrete cubes of 30 cm sides have resulted in either missing cubes or deposition of cubes. Few traditional huts built along the coast have gone due to sand/soil being eroded. Land subsidence, according to modern technology is common in these low-lying areas where soft sediments may still be consolidating.

Drought

Drought is a common disaster in Tuvalu and is strongly linked to the ENSO phenomenon. Droughts are likely to be associated with a positive SOI. The capital Funafuti because it is the most populated island from the nine islands that make Tuvalu, it experiences drought most frequently than the rest of the islands.

Pest

A pest has seriously affected only one of the islands in Tuvalu namely Nanumaga. Coconut trees, breadfruit trees and so many other trees were completely ruined by the pests. Monitoring of this disaster is still on but is now not so serious.

Tornado

On May 7th around 7.30am a small tornado < 10 m in diameter pulled off the roof of the Tuvalu Telecommunication building on Funafuti.

Downbursts

A downburst is a weather phenomenon commonly associated with tropical maritime thunderstorms. Strong winds at middle levels 3 to 5 km above the ground are transferred to the surface in thunderstorm downdrafts. In 1997 Feb 5-6 downbursts occurred on Niutao to damage a few houses, to uproot a few coconut trees and breadfruit trees. Meteorological records in Funafuti showed that upper winds around 500hPa (5 km) at this time were up to 35 knots and therefore possible that there were even stronger winds at these levels at some stage on the 5th and 6th. These winds could have transferred to the surface as strong

downdrafts from severe thunderstorm clouds in the form of "Downbursts".

Scientific Research

There is minimal scientific research relating to El Niño that has been done in Tuvalu. The research work that has been carried out does not remain in Tuvalu because exchange of knowledge from the consultant to the local level is nil. These consultants would visit the Tuvalu Meteorological Service to access meteorological/climatological data and would only provide at the end of the research work a report. There has never been any co-working attitude to ensure that research can be passed on to the local level and therefore maintained at the local level.

1997-98 EVENT

The Meteorological Service would be aware that there is an El Niño event from reading the Climate Monitoring Bulletin prepared by the Bureau of Meteorology. These monthly bulletins are received by airmail. The media would be reporting on the El Niño event when the event has already commenced and the country is being affected by disaster.

The media was aware of the El Niño event of 1992-93 El Niño when Nina and Kina devastated all the Tuvalu islands.

The pattern that has been picked up in the Tuvalu waters is that an El Niño event is associated with a high probability of tropical cyclones. From the rainfall records of Funafuti the 1982-83 event has given a very wet period from Sept 1982 to Mar 1983.

National Responses

There was no statement from the Meteorological Service (Government) that was issued before the impacts of the 1997-98 appeared. But there was the continuous broadcast of the special weather bulletin due to the tropical cyclones affecting Tuvalu during this period. There were two damage assessment reports conducted and written. The first report was done after tropical cyclones Gavin and Hina (March 1997) and the second one after tropical cyclone Keli (June 1997).

ENSO is considered as a signal to prepare for expected cyclones in particular during the cyclone season and also possible before and after the cyclone season or for droughts.

Conclusions

The main obstacles seen to have prevented issuing of a statement forecast to the public on an ENSO event is the insufficient information coming into the Meteorological office, the limited knowledge to interpret the information and to do analysis on the data available. It would be a big step forward if ENSO forecasting were incorporated into the Tuvalu, National Disaster plan.