



UNISDR Scientific and Technical Advisory Group Case Studies – 2015 Integrating scientific and local knowledge for disaster risk reduction and climate change adaptation in Timor-Leste

The problem

Timor-Leste is especially vulnerable to a wide range of natural hazards including droughts, floods, high winds, landslides, earthquakes, tsunamis and a changing climate which have a severe impact upon Timor-Leste; given over 70% of the population depends upon agriculture for their livelihood.¹

Timor-Leste has a severe lack of historical disaster and meteorological data available as information has either not been recorded or has been lost or destroyed². This has hindered the ability of Timor-Leste to predict and mitigate against droughts, floods, high winds, landslides, earthquakes, tsunamis and the impacts of climate change. Timor-Leste is further constrained by challenges faced by many SIDS (Small Island Developing States),³ including the establishment of adequate communication and coordination structures between (and across) national and local level government to address hazards and ensure cross-cutting issues such as Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) are integrated and understood across all sectors.⁴ These factors have contributed to significant gaps and challenges for DRR and CCA in Timor-Leste⁵. This case study presents some lessons from a Participatory Action Research project funded by AusAID and led by Oxfam Australia to integrate local and scientific knowledge for disaster risk reduction and climate change adaptation in Timor-Leste

The science

Results of recent studies undertaken in Indonesia, Australia and Asia by the Pacific Climate Change Science Program indicate that under climate change Timor-Leste will experience temperature and rainfall fluctuations, in addition to sea level rise with predictions of a 'low' value of 18cm (+8) increase by 2055 relative to 1990 and an increase in acidification of the sea⁶. Various data sets are required to detect and attribute local climate variability and change, and for developing policy and action for DRR and CCA across sectors. A project to validate the scientific information utilising local knowledge was undertaken in 2010-2012 by a consortium of four international non-governmental organisations (INGOs) and their local partners, funded by AusAID and led by Oxfam Australia. Participatory Action Research was carried out in six districts to identify historical and present day climate change impacts at the local level. Information gathered from community members including rainfall levels, hazard events, temperatures and unusual wet/dry seasons noted, was based on observed trends only and should be considered carefully, yet community members were largely in agreement with current scientific projections⁷. Community members also highlighted other contributory factors exacerbating climate change impacts including poor land use management e.g. 'slash and burn' activities and deforestation⁸. Science provides broad scale predictions for climate change impacts in Timor-Leste. Due to , diverse landscape and potential differences in localised impacts, integration of local knowledge would help to identify appropriate local responses for disaster risk reduction and climate change adaptation in Timor-Leste

The application to policy and practice

Since undertaking the research, the international NGOs and local partners involved are now working with communities utilising available scientific and local knowledge to implement appropriate DRR and CCA actions. There has been enhanced knowledge and awareness through the production of community-based DRR and CCA materials integrating scientific and local expertise including film, theatre and posters. Community members and government officials including Timor-Leste's president met at a Community Climate

Change Congress in Dili to discuss the research results and their application to policy and practice. This activity was especially important given that climate change is a growing concern within Timor-Leste, with ample opportunity to link bottom up knowledge with top down support. Most importantly the research has highlighted the need to integrate scientific and local knowledge for DRR and CCA across sectors within national and local level government structures. Local and international NGOs with recognised DRR experience in this area are now included within relevant policy development meetings at national government level.

Did it make a difference?

The benefits of this program and the use of scientific and local knowledge for DRR and CCA continue to be built upon in a country focused upon nation-building. There has been improved dialogue between communities, local partners, INGOs and government officials in developing appropriate policy and practice incorporating scientific and local knowledge, including Timor-Leste's National Adaptation Program of Action for climate change and National Disaster Risk Management Policy. Community members have increased knowledge and access to science on local climate change impacts. This has contributed to increased capacity to integrate disaster risks into local livelihood strategies e.g. through determining when and where to plant, using drought resistant crops and utilising simple hazard mitigation techniques such as terracing and gabions. Locally relevant climate change information and resources are available for various stakeholders at national and local levels. Community and local level government plans are starting to incorporate relevant scientific and local knowledge leading to improved livelihoods e.g. the implementation of terracing and vegetation to stabilise the soil has ensured soil fertility levels are kept high and valuable top soil is not washed away as a result of excess rainfall, food security e.g. use of intercropping, agro-forestry and crop diversification have ensured a variety of crops are available if one crop was to fail and environmental outcomes e.g. reforestation and use of agro-forestry will in the long term contribute to water conservation and reduce run-off contributing to flood damage and landslides. In a country tackling various sustainability and nation-building challenges such small achievements are essential building blocks for the integration, and use of, scientific and local knowledge for DRR and CCA in Timor-Leste⁹.



Image 1: Reforestation in Timor-Leste for disaster risk reduction and climate change adaptation. Source: Tim Herbert, Oxfam Australia,

References

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- ³ Kelman, I (2014) No change from climate change: vulnerability and small island developing states. Volume 180, The Geophysical Journal, Chapter 2, pp 120-129, the Royal Geographical Society. doi:10.1111/geoj.12019
- ⁴ Mercer, J., Kelman, I., do Rosario, F., de Deus de Jesus Lima, A., da Silva, A., Beloff, AM., McClean, A. (In Press). Nation-building policies in Timor-Leste: Disaster Risk Reduction and Climate Change Adaptation. *Disasters*.
- ⁵ *Ibid*

⁶ Australian Bureau of Meteorology and CSIRO (2011) East Timor (Timor-Leste) In: Climate Change in the Pacific: Scientific Assessment and New Research. Volume 2: Country Reports. Chapter 3: pp. 43-54. Australian Bureau of Meteorology and CSIRO: Australia.

⁷ Oxfam Australia (2012) Weathering Change in Timor-Leste: Participatory Action Research in Timor-Leste identifying climate change and associated impacts experienced at the community level. Oxfam Australia: Melbourne.

⁸ *Ibid*

⁹ Mercer, J., Kelman, I., do Rosario, F., de Deus de Jesus Lima, A., da Silva, A., Beloff, AM., McClean, A. (In Press). Nation-building policies in Timor-Leste: Disaster Risk Reduction and Climate Change Adaptation. *Disasters*.