Dear Anonymous Referee #1,

We would like to thank you for your thoughtful and considered comments, which will ultimately improve our paper. We have addressed each of your comments *(in blue)* below and made a series of additions/amendments to the paper *(in red).*

General Comments

1. *Although a lot of work was done, the paper could be improved. It missed important issues that should be added to better explain the differences that emerged in the survey results. The results across the three islands could be related to the differences in the frequency and intensity of the TCs or in the differences of the social context of the island. Data related to the occurrences of TCs and of the social vulnerability should be quantified to provide the readers useful information for understanding the context of the survey and to discuss the differences in the survey results.*

   Response: The authors have considered these comments and will make adjustments to the manuscript accordingly. In particular, the revised manuscript will refer to the frequency of TC events (In terms of the average number of TCs per year) and provide more examples of TC activity and their associated impacts. Further, the introduction will be modified to introduce the socio-economic characteristics of each nation and discuss their associated vulnerability to TC activity. Here we will refer to the Human Development Index (HDI; United Nations Development Program, 2015), Gross Domestic Product (GDP) per captia, relative TC risk index (Peduzzi et al., 2012) of each nation and make reference to economic impacts of previous TC events. This will provide the reader with a much clearer understanding of the demographics of FVT and improve the context of the survey results.

   See paragraph below which will be included in the revised introduction:

   "Fiji, Vanuatu and Tonga (FVT) are three SIS that are highly vulnerable to the impacts of TCs. Of the 12.9 TCs that occur in the SWP per year, 3.3, 3.9 and 2.7 TCs cross within 5° (550km) of FVT respectively (Diamond et al., 2013)*. Vanuatu is considered the most vulnerable nation in the world to the threat of natural hazards* (World Bank, 2015)*, and is the most economically disadvantaged country due to the impact of natural hazards* (World Bank, 2006)*. Between 1950-2005, Vanuatu's losses due to natural hazards were equivalent to 30% of its GDP in disaster years* (World Bank, 2006)*. Vanuatu's relative TC risk (a calculation of the exposure and vulnerability to TC activity) is the highest in the world (8/10), with 30-100 deaths per million per year* (Peduzzi et al., 2012)*. Moreover, 100% of Vanuatu's population and GDP are located in a TC prone area. The impact of TCs in Vanuatu are exacerbated by Vanuatu's medium Human Development Index ranking (HDI; United Nations Development Program 2015), ranked 134 out of 188 countries and territories and GDP per capita of US$3277. Fiji and Tonga are similarly vulnerable to TCs. Both have relative TC risk of 7/10; a mortality risk of 10-100 people per million and 100% of their population and GDP is situated in a TC prone area. However, in comparison with Vanuatu, the economic impact of TCs on Fiji and Tonga is quite different. Fiji and Tonga are considered high human development nations, ranked 90/188 and 100/188 respectively (United Nations Development Program, 2015), with higher a GDP per capita: US$4375 (Fiji) and US$4427 (Tonga). Between 1950-2005, natural disasters cost Fiji 7.7% and Tonga 14.2% GDP during disaster years* (World Bank, 2006)*."*

2. *Respondents answers on the impacts and on the damages caused by TCs should be related with objective data, collected by governmental offices or by insurance companies, to give a measure of the truthfulness of the respondent's perception.*

Response: Cross-referencing the impacts and damages caused by TCs with objective data is a valuable suggestion. In response, objective data, particularly regarding the impact on housing stocks, economic implications and the impact on agriculture will be included in the manuscript for the recent events: TC Evan (Fiji), TC Pam (Vanuatu) and TC Ian (Tonga). Instead of providing an assessment on the 'truthfulness' of respondents perception (as respondents may have been impacted differently and recall different experiences), facts/figures from specific TC events aligned with the majority of responses will been included. An example of this for TC Evan is included below:

"The SWP Islands are very much reliant on subsistence farming (Mataki et al., 2006; Mimura, 1999)*. Indeed, the impact of TCs on the agricultural sector of Pacific Island nations represents 22% of the overall economic impact (between 2003-2013;* (Food and Agriculture Organisation of the United Nations, 2015)*. The economic impacts on farming and agriculture were discussed by 24% of respondents. Notably, the impact of increased prices was mentioned. Cassava (Manihot esculenta), a staple Fijian vegetable was used as one such example. One respondent told us "the price of Cassava usually increases after the cyclone. It usually costs FJ$3 (US$1.30) for a heap, but after the price can rise up to FJ$9 (US$4.10) a heap". The price is subsequently driven upward by the destruction of arable land and shortage of crop. A similar scenario was noted for fish stocks, as fishermen are unable to go to sea because of dangerous and unfavourable conditions. This shortage of product, in turn increases the price of fish, another staple food in Fiji. The loss of income during a TC was also discussed as the survey revealed it is common practice for businesses to cease paying their employees for the duration that trading has stopped. A discussion with a Kava (a western Pacific crop; Piper methysticum) producer and vendor in Nadi Market highlighted significant economic losses after Cyclone Daphne (March/April 2012), with a loss of earnings and damaged/destroyed crops totalling approximately US$8,500. A post-disaster report of TC Evan (December 2012) noted that the loss of earnings for agricultural workers was significantly high, with over 50% of Fiji's loss of earnings coming from this sector alone* (GOF, 2013)*. The sharp increase in the price of housing material after a TC event was also mentioned as hampering the rebuilding process."*

3. *Some references of previous studies in the use of public perception of natural hazards, should be added to highlight the importance of the survey.*

Response: The revised manuscript will include references of previous studies that address the public perception of natural hazards, including: drought (Ashraf and Routray, 2013; Udmale et al., 2014), climate change (Acquah, 2011; Deressa et al., 2011; Manandhar et al., 2011, 2015; Vedwan and Rhoades, 2001) and tropical cyclones (Li, 2009). The revised introduction will also discuss the uses and benefits of natural hazard perception, e.g. it can be used to inform policy makers to assess and modify risk management procedures (see revised paragraph below).

"The impacts of TCs in the SWP mean that viable and effective adaptation and mitigation strategies are needed (Mataki et al., 2006; Mortreux and Barnett, 2009; Rasmussen et al., 2009). El-Masri and Tipple, (2002) *highlight how such methods should be multi-disciplinary and based on a range of engineering, land management, social and economic improvements. One such measure relevant to this study includes the use of community participation. Gathering the opinions and perceptions of extreme events from the people at risk of natural disasters provides emergency management agencies the opportunity to assess and modify risk management procedures* (Bird, 2009)*. The benefits of this information, which can result in a more resilient nation that is less vulnerable to the threat of an extreme event is demonstrated by* Wachinger et al., (2010, 2013)*. Across the world, surveys have also been used to understand public perception on a range of environmental extremes*

and hazards including: drought (Ashraf and Routray, 2013; Udmale et al., 2014), climate change (Acquah, 2011; Deressa et al., 2011; Manandhar et al., 2011, 2015; Vedwan and Rhoades, 2001) and tropical cyclones (Li, 2009). Weather related traditional knowledge (TK) has also been shown to be a cost-effective, participatory and sustainable method of adaptation (Nyong et al., 2007; Robinson and Herbert, 2011). The use of weather related TK, involves documenting the response of the land (flora and fauna) and sea to specific meteorological phenomenon. Numerous studies have demonstrated the usefulness of TK in improving our understanding of environmental prediction and meteorological phenomenon in the South Pacific (Chand et al., 2014; Lefale, 2009; Waiwai and Malsale, 2013), and in other areas around the world including, Africa (Chang'a, 2010; Nyong et al., 2007; Shoko and Shoko, 2013), India (Chinlampianga, 2011) and Australia (Green et al., 2010). These studies demonstrate that personal experiences and knowledge of extreme events (such as TCs) from those living in affected regions represents a crucial source of information. It offers scientists, policy makers and social development workers the opportunity to incorporate a comprehensive insight into local-scale weather systems, impacts and coping strategies."

Specific Comments

4. *The introduction should be improved*

Response: In response to this comment (and those from anonymous referee #2), the introduction will be significantly reworked to include more detail. Examples of previous TC events (TC Kina, TC Evan and TC Pam) have been included to highlight the potential damage of TCs. The authors have included statistics on the annual number of TCs in the region (12.9 TCs per year), and the number that pass within 5° (550km) of FVT (3.3, 3.9 and 2.9 respectively). To better understand the social context of FVT, a profile of the socio-economic characteristics and associated TC risk are presented, e.g. Human Development Index (HDI; United Nations Development Program, 2015), Gross Domestic Product (GDP) per captia and the relative TC risk index (Peduzzi et al., 2012). The relative TC risk index explores the percentage of the population and GDP exposed to TC activity and the average mortality rate. This is a useful tool in comparing the vulnerability and risk of each nation. In addition, the introduction frames how risk perception surveys/questionnaires can reduce vulnerability, improve resilience and provide emergency management agencies and policy makers an insight for assessing and modifying risk management procedures. Lastly, the introduction discusses other weather related traditional knowledge (TK), its uses and benefits, other studies that utilise TK and how this resource fits into our study.

5. *The percentage numbers are not very legible*

Response: On consideration, the percentage values are not required and will be removed from Fig. 2, Fig. 5 and Fig. 6. The respective percentages/values can be easily interpreted by the reader.

6. *Figs. 8 and 9 are very interesting but the text inside the box could be difficult to read*

Response: Both figures have been reworked. The former Fig. 8 (which will be Fig. 7 in the revised paper) has been edited following a comment from anonymous referee #2. The figure now contains less text and the text size has been increased. Similarly, Fig. 9 has been reworked following the comments made by anonymous referee #2. The text has also been edited and enlarged. The authors will liaise with the type-setters if the paper is accepted to ensure all figures can be read with ease.

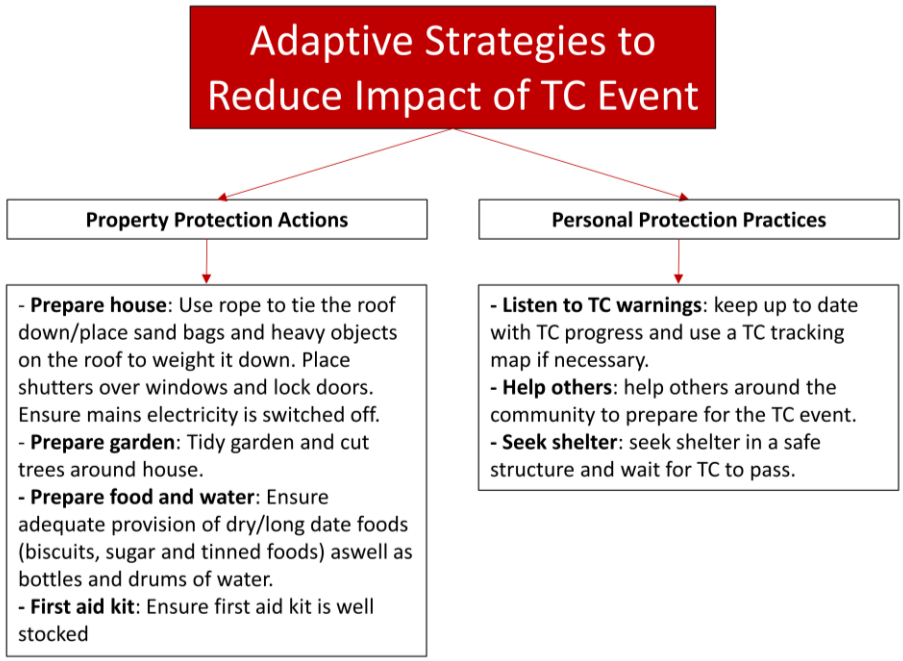

Figure 7. Schematic summarising methods adaptive strategies to reduce the impact of a TC event

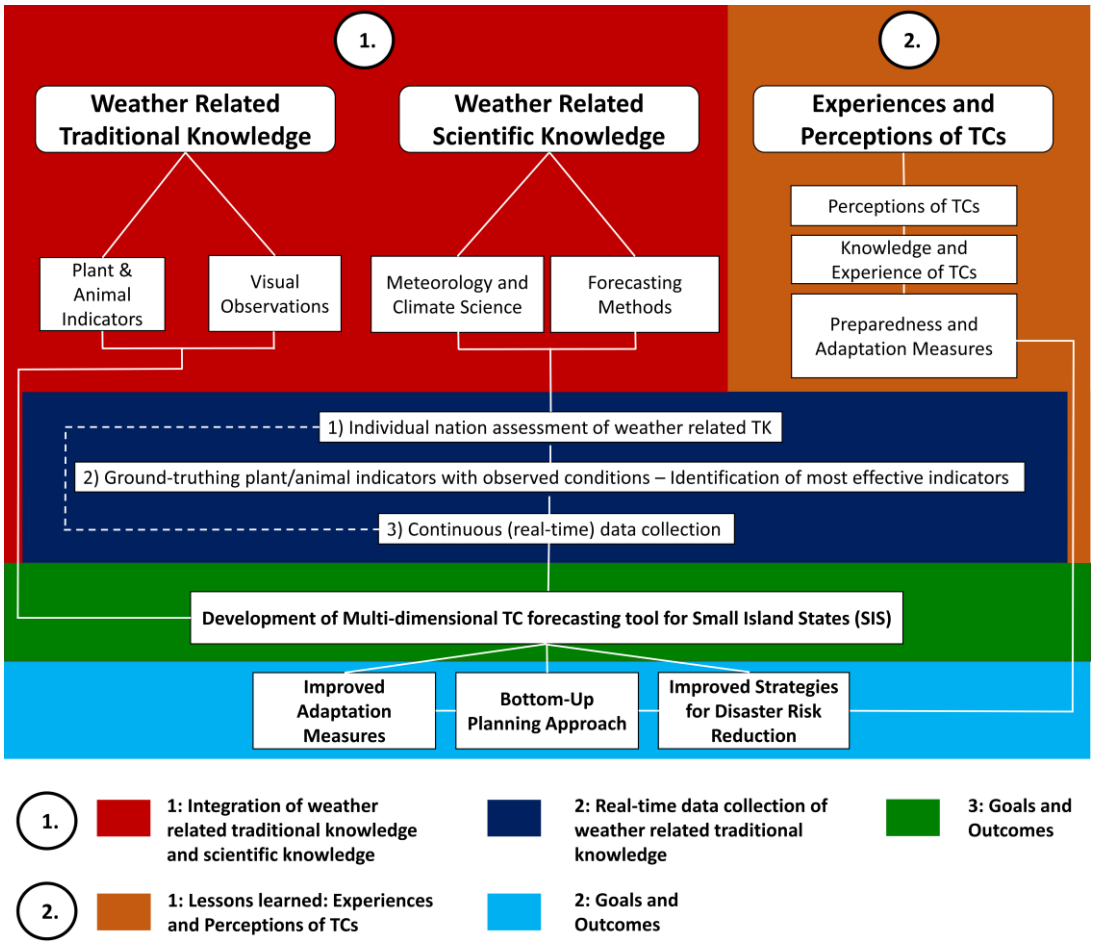

Figure 9. Proposed conceptual framework to improve adaptation measures and improved strategies for disaster risk reduction for the small island states (SIS) of the Southwest Pacific (SWP).

7. *Page 7144 line 4: based, please delete and Page 7150 line 3: characteristics, please delete.*

Response: These changes will be made to the text.

In-text Comments

These comments referred to comments #5-7. See responses above.

References

Acquah, H. D.: Farmers perception and adaptation to climate change: A willingness to pay analysis, J. Sustain. Dev. Africa, 13(5), 150–161, 2011.

Ashraf, M. and Routray, J. K.: Perception and understanding of drought and coping strategies of farming households in north-west Balochistan, Int. J. Disaster Risk Reduct., 5, 49–60, doi:10.1016/j.ijdrr.2013.05.002, 2013.

Bird, D. K.: The use of questionnaires for acquiring information on public perception of natural hazards and risk mitigation – a review of current knowledge and practice, Nat. Hazards Earth Syst. Sci., 9(4), 1307–1325, doi:10.5194/nhess-9-1307-2009, 2009.

Chand, S. S., Chambers, L. E., Waiwai, M., Malsale, P. and Thompson, E.: Indigenous Knowledge for Environmental Prediction in the Pacific Island Countries, Weather. Clim. Soc., 4, 445–450, doi:10.1175/WCAS-D-13-00053.1, 2014.

Chang'a, L.: Indigenous knowledge in seasonal rainfall prediction in Tanzania: a case of the South-western Highland of Tanzania, J. Geogr. …, 3(April), 66–72 [online] Available from: http://idl-bncidrc.alioktay.net/dspace/handle/10625/48748 (Accessed 1 September 2014), 2010.

Chinlampianga, M.: Traditional knowledge , weather prediction and bioindicators : A case study in Mizoram , Northeastern India, Indian J Tradit Knowl, 10(January), 207–211 [online] Available from: http://nopr.niscair.res.in/handle/123456789/11083 (Accessed 1 September 2014), 2011.

Deressa, T. T., Hassan, R. M. and Ringler, C.: Perception of and adaptation to climate change by farmers in the Nile basin of Ethiopia, J. Agric. Sci., 149, 23–31, doi:10.1017/S0021859610000687, 2011.

Diamond, H. J., Lorrey, A. M. and Renwick, J. A.: A Southwest Pacific Tropical Cyclone Climatology and Linkages to the El Niño–Southern Oscillation, J. Clim., 26(1), 3–25, doi:10.1175/JCLI-D-12-00077.1, 2013.

El-Masri, S. and Tipple, G.: Natural Disaster, Mitigation and Sustainability: The Case of Developing Countries, Int. Plan. Stud., 7(2), 157–175, doi:10.1080/13563470220132236, 2002.

Food and Agriculture Organisation of the United Nations: Emergency Preparedness and Disaster Risk Reduction in the Pacific, Apia, Samoa. [online] Available from: http://www.fao.org/fileadmin/user_upload/sap/docs/INF-PNG-002 Emergency Preparedness and Disaster Risk Reduction in the Pacific 2015.pdf, 2015.

GOF: Fiji and TC Evan: Post-Disaster Needs Assessment, Report Prepared by the Government of Fiji (GOF)., 2013.

Green, D., Billy, J. and Tapim, A.: Indigenous Australians' knowledge of weather and climate, Clim. Change, 100(2), 337–354, doi:10.1007/s10584-010-9803-z, 2010.

Lefale, P. F.: Ua 'afa le Aso Stormy weather today: traditional ecological knowledge of weather and climate. The Samoa experience, Clim. Change, 100(2), 317–335, doi:10.1007/s10584-009-9722-z, 2009.

Li, G. M.: Tropical cyclone risk perceptions in Darwin, Australia: a comparison of different residential groups, Nat. Hazards, 48(3), 365–382, doi:10.1007/s11069-008-9269-8, 2009.

Manandhar, S., Vogt, D. S., Perret, S. R. and Kazama, F.: Adapting cropping systems to climate change in Nepal: A cross-regional study of farmers' perception and practices, Reg. Environ. Chang., 11(2), 335–348, doi:10.1007/s10113-010-0137-1, 2011.

Manandhar, S., Pratoomchai, W., Ono, K., Kazama, S. and Komori, D.: Local people's perceptions of climate change and related hazards in mountainous areas of northern Thailand, Int. J. Disaster Risk Reduct., 11, 47–59, doi:10.1016/j.ijdrr.2014.11.002, 2015.

Mataki, M., Koshy, K. and Nair, V.: Implementing Climate Change Adaptation in the Pacific Islands : Adapting to Present Climate Variability and Extreme Weather Events in Navua (Fiji), Assessments of Impacts and Adaptations to Climate Change (AIACC), AAIACC Working Paper No. 34, The AIACC Project Office, International START Secretariat, 2000 Florida Avenue, NW Washington DC, 20009, USA., 2006.

Mimura, N.: Vulnerability of island countries in the South Pacific to sea level rise and climate change, Clim. Res., 12, 137–143 [online] Available from: http://www.acclimate-oi.org/strategie/04_bibliographie/Bibliographie_COI_E2008_V3/09_Pacifique/Vulnerability of island countries in the South.pdf (Accessed 2 May 2014), 1999.

Mortreux, C. and Barnett, J.: Climate change, migration and adaptation in Funafuti, Tuvalu, Glob. Environ. Chang., 19(1), 105–112, doi:10.1016/j.gloenvcha.2008.09.006, 2009.

Nyong, A., Adesina, F. and Osman Elasha, B.: The value of indigenous knowledge in climate change mitigation and adaptation strategies in the African Sahel, Mitig. Adapt. Strateg. Glob. Chang., 12(5), 787–797, doi:10.1007/s11027-007-9099-0, 2007.

Peduzzi, P., Chatenoux, B., Dao, H., De Bono, a., Herold, C., Kossin, J., Mouton, F. and Nordbeck, O.: Global trends in tropical cyclone risk, Nat. Clim. Chang., 2(4), 289–294, doi:10.1038/nclimate1410, 2012.

Rasmussen, K., May, W. and Birk, T.: Climate change on three Polynesian outliers in the Solomon Islands: impacts, vulnerability and adaptation, Geogr. Tidsskr. - Danish J. Geogr., 109(1), 1–13, doi:10.1080/00167223.2009.10649592, 2009.

Robinson, J. B. and Herbert, D.: Integrating climate change and sustainable development, Int. J. Glob. Environ. Issues, 1, 130–149, 2011.

Shoko, K. and Shoko, N.: Indigenous Weather Forecasting Systems: A Case Study of the Abiotic Weather Forecasting Indicators for Wards 12 and 13 in Mberengwa District Zimbabwe, Asian Soc. Sci., 9(5), 285–297, doi:10.5539/ass.v9n5p285, 2013.

Udmale, P., Ichikawa, Y. and Manandhar, S.: Farmers ' perception of drought impacts , local adaptation and administrative mitigation measures in Maharashtra, Int. J. Disaster Risk Reduct., 10, 250–269, doi:10.1016/j.ijdrr.2014.09.011, 2014.

United Nations Development Program: Human Development Report 2015. [online] Available from: http://hdr.undp.org/sites/default/files/hdr_2015_statistical_annex.pdf, 2015.

Vedwan, N. and Rhoades, R.: Climate change in the Western Himalayas of India: a study of local perception and response, Clim. Res., 19(2), 109–117, doi:10.3354/cr019109, 2001.

Wachinger, G., Renn, O., Domènech, L., Jakobson, I., Kuhlicke, C., Lemkow, L., Pellizzoni, L., Piriz, A., Saurí, D., Scolobig, A., Steinführer, A., Supramaniam, M., Whittle, R., Bianchizza, C., Coates, T. and Marchi, B. De: Risk perception and natural hazards, Stuttgart. [online] Available from: http://caphaz-net.org/outcomes-results/CapHaz-Net_WP3_Risk-Perception2.pdf, 2010.

Wachinger, G., Renn, O., Begg, C. and Kuhlicke, C.: The Risk Perception Paradox-Implications for Governance and Communication of Natural Hazards, Risk Anal., 33(6), 1049–1065, doi:10.1111/j.1539-6924.2012.01942.x, 2013.

Waiwai, M. and Malsale, P.: National Workshop on Traditional Knowledge of Weather and Climate, Lounamua Village, Pele Islands, Efate, Vanuatu (15-19th April 2013)., 2013.

World Bank: Not if, but when: Adapting to natural hazards in the Pacific Island Region, A policy note, The World Bank, East Asia and the Pacific Region, Pacific Islands Country Management Unit, Washington, D C,., 2006.

World Bank: Post-Disaster Needs Assessment: Tropical Cyclone Pam, Post-Vila, Vanuatu., 2015.