Innovation in PPE – multi-hazards early warning system in the Pacific

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Agenda

- Innovation in PPE- early warning system
- Introduction to Tonkin + Taylor International
- Project examples on PPE
- Lessons learned
- Way forward

Innovation in PPE

Five ways of private sector engagement in DRR

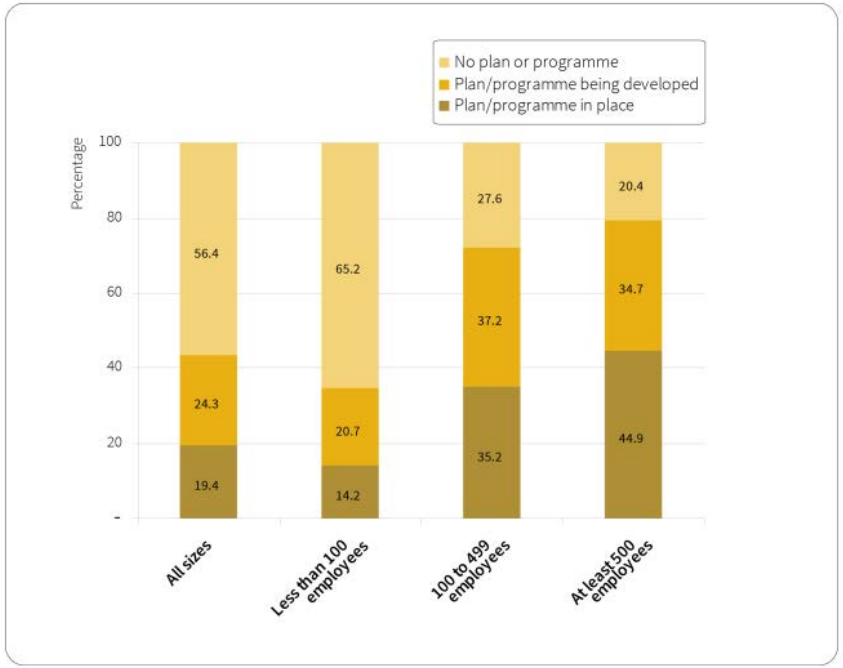
Direct assistance to communities (emergency distribution, search and rescue, etc.)

Disaster preparedness for own business (BCP/BCM, response and recovery plans, etc.)

Developing innovative products based on business, technology, and expertise (insurance, communication, infrastructure, etc.)

Joint projects with NGOs, governments, and international organizations as implementer, not donor

Establishment of private foundations, NGOs, and trusts



UNDRR, 2013

Economic- Benefits

- USD 1 investment, a return of USD 6 in benefits in the Pacific cyclone early warning system. Case study from Samoa (Fakhruddin, 2019)
- Experiment showed that every USD 1 invested, a return of USD 40.85 in benefits over a ten-year period may be realized. Case study from Bangladesh (World Bank, 2012).
- Willingness to pay improved EWS was estimated US$ 5.57 per year (Ahsan et al., 2020)

Progress in Disaster Science 2 (2019) 100034

Contents lists available at ScienceDirect

Progress in Disaster Science

journal homepage: www.elsevier.com/locate/pdisas

Benefits of economic assessment of cyclone early warning systems - A case study on Cyclone Evan in Samoa

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ARTICLE INFO

Article history:
Received 14 January 2019
Received in revised form 27 May 2019
Accepted 26 June 2019
Available online 6 July 2019

Keywords:
Cyclone
Economic assessment
Disaster risk
Samoa

ABSTRACT

Samoa is extremely exposed to natural hazards, particularly tropical cyclones and earthquake-generated tsunami. Some studies have put forth the position that adequate investment in early warning systems can contribute to the social and economic well-being of countries. However, in spite of these research findings there is still a lack of understanding on how to measure effectiveness that leads to limited investment. Cost-benefit analysis (CBA) is a tool used in this study to summarize the value for money in terms of investment to enhance an early warning system. This paper aims to summarize the benefits of adopting early warning systems and its effectiveness against the investment required and its value proposition. Data from the 'Samoa Post-Disaster Needs Assessment of the Cyclone Evan event in 2012' have been used to assess damage information, and stakeholders consultations and interviews were carried out for cost-benefit analysis. We have conducted quantified CBA of early warning services for cyclone hazards and the results have shown that for every USD 1 invested, there is a return of USD 6 as benefit. This paper suggests that economic assessment of early warning services could help in quantifying pre-impact assessment to demonstrate to policy makers the economic benefit of disaster risk reduction (DRR).

Preferences for improved early warning services among coastal communities at risk in cyclone prone south-west region of Bangladesh

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ARTICLE INFO

Article history:
Received 5 September 2019
Received in revised form 28 December 2019
Accepted 4 January 2020
Available online 08 January 2020

Keywords:
Cyclone
Bangladesh
Early warning
Disaster risk
Willingness-to-pay
Choice experiment

ABSTRACT

Cyclone early warning systems are the primary sources of information that enable people to develop a preparedness strategy to mitigate the hazards of cyclones to lives and livelihoods. In Bangladesh, cyclone early warnings have significantly decreased the number of cyclone related fatalities over the last two decades. Nevertheless, several challenges remain for existing early warning services (EWS), urging for both technical and non-technical improvements in the said services. Given limited financial resources, the economic efficiency assessment of the improvement is highly important. Therefore, this study aims to estimate the willingness to pay (WTP) for improved warning services by considering the at-risk households' trade-off between proposed improved EWS and existing EWS in coastal Bangladesh. Applying systematic random sampling, 490 respondent households were selected from Khulna, Satkhira, and Barguna districts, with whom a choice experiment (CE) was performed. The CE was designed by incorporating impact-based scenarios for improved EWS. As analytical tools, Conditional and Mixed-Logistic regression models were used that derived the WTP for improved EWS attributes. Empirical results show that the WTP of an at-risk household for improved EWS was estimated at Bangladeshi Taka BDT 468 (≈ US$ 5.57) per year, implying respondents were ready to pay for the improvement of the warning attributes, including precise information of the cyclones landfall time with possible impacts, more frequent radio forecasts, and voice messages in the local dialects over mobile phones. A revenue stream

About Tonkin + Taylor International

About Tonkin + Taylor

- Founded in 1959
- Proudly 100% employee owned and operated
- New Zealand's leading environmental and engineering consultancy, with offices in New Zealand, Australia and Malaysia

Over 900 staff in the T+T Group

Our services

- Geotechnical
- Civil
- Water
- Environmental
- Natural Hazard Resilience
- Transport
- Planning
- Ecology
- Transport
- Hydrogeology
- Waste and contaminated land
- Data and digital solutions
- Stakeholder engagement

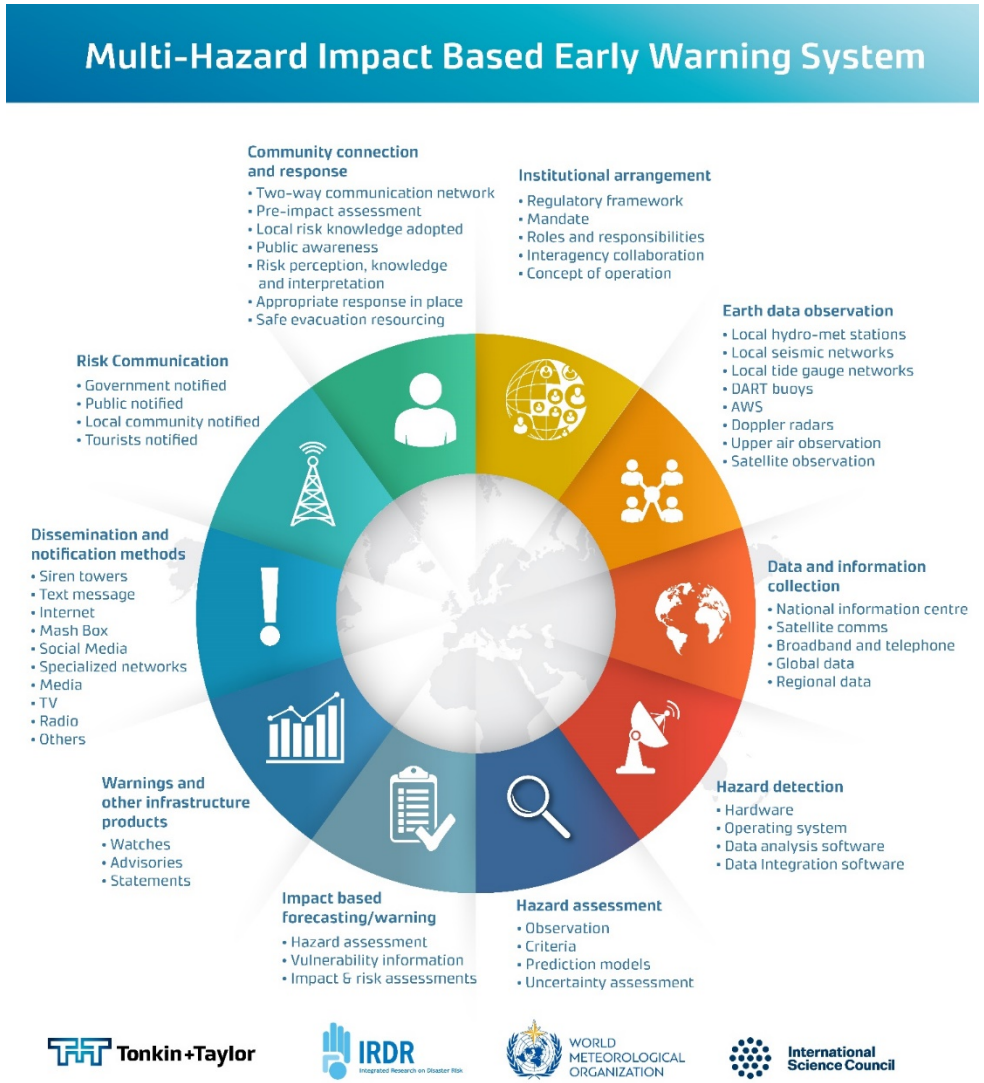
We shape the interface between people and the environment - earth, water and air - using science and engineering.

Recent examples of client and peer recognition

- Beaton Client Choice Award: Best consulting engineer in Australasia in A$50-A$200M category (2019 and 2016)
- Resource Management Law Association Award (2018): NCTIR planning
- ACENZ Innovate Awards of Excellence (2018): Canterbury Earthquakes complex land damage (Gold)
- Civil Contractors NZ Excellence Awards (2018): Waitangi Wharf upgrade
- Beaton Client Choice Award: Best provider to construction and industry (2018)
- ACENZ Innovate Awards of Excellence (2017): Taumana Reserve (Gold and Community Award)

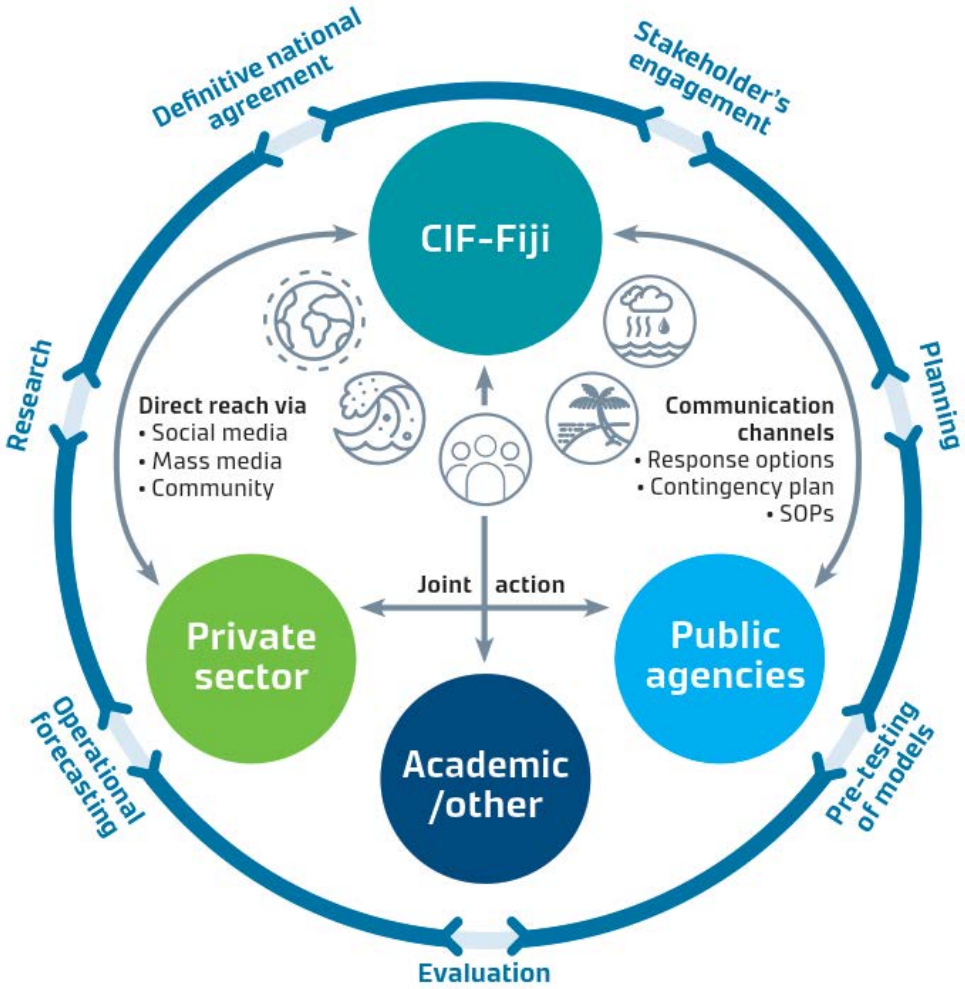
Project examples- Innovation in PPE

System Based Thinking- Total Warning Concept (Multi-Hazards Impact Based EWS): Fiji, Tonga, Samoa



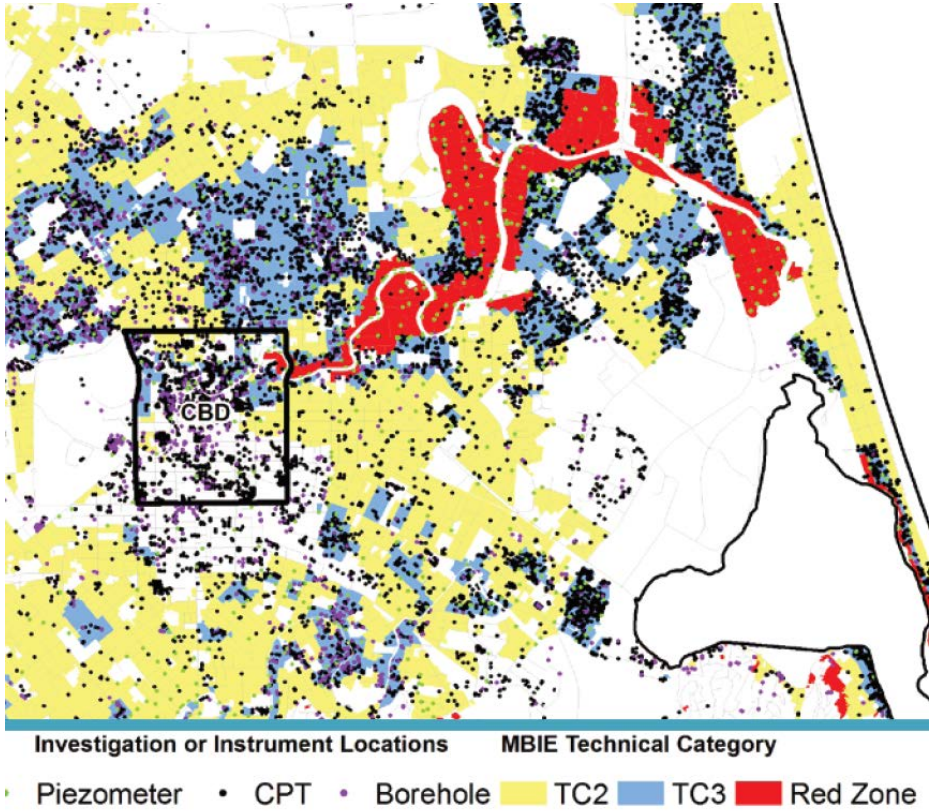
Coastal Inundation Forecasting – Fiji

- The innovative forecasting project is unique, for the first time in Pacific history bringing together the hydrological, oceanographic, and meteorological communities to create enhanced capability for accessible, understandable, and actionable warnings



Canterbury Geotechnical Database

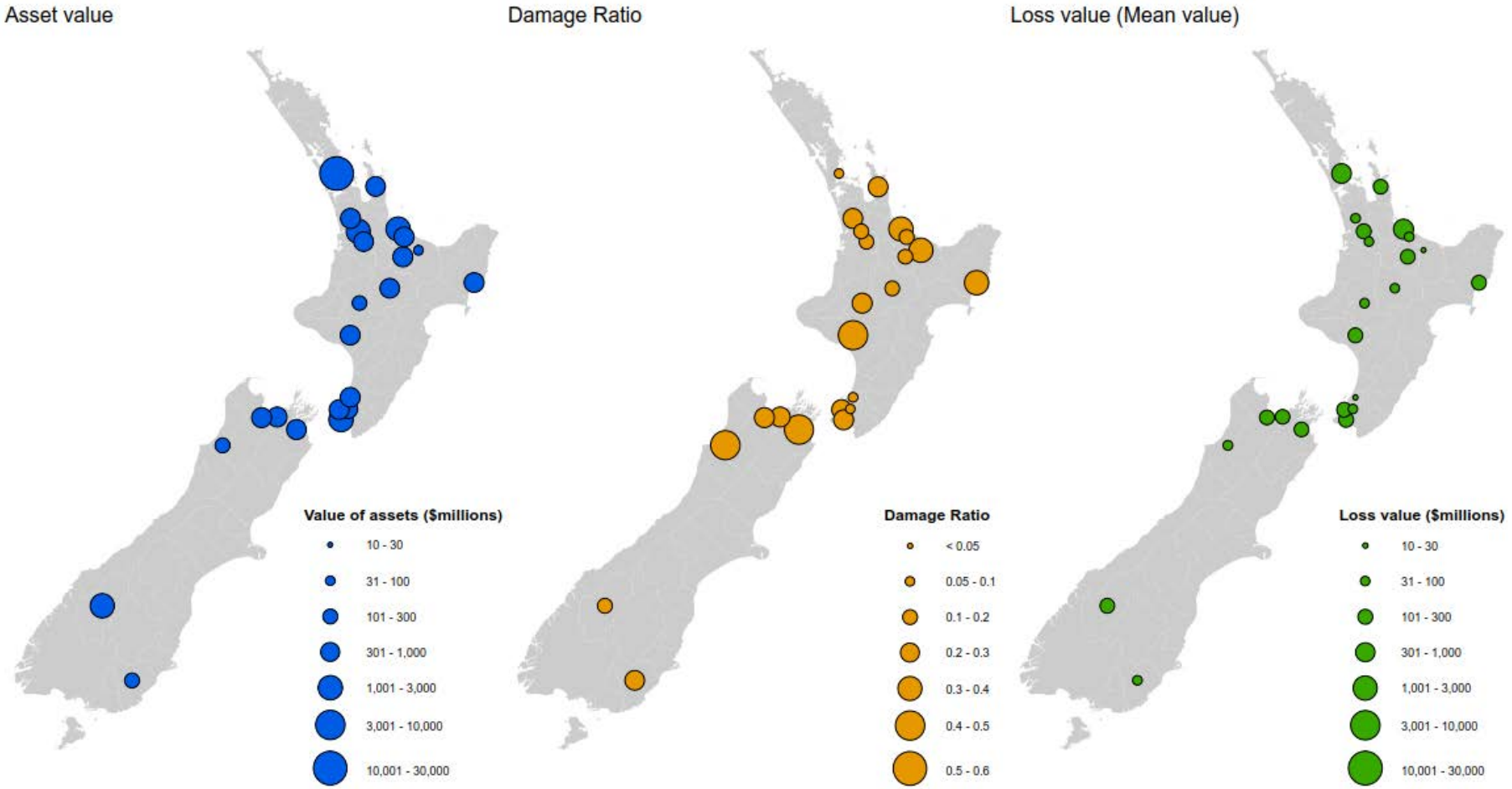
- The Canterbury Geotechnical Database (CGD) is an online database that Tonkin + Taylor developed to assist in the rebuild of Christchurch following the 2010-2011 Canterbury Earthquake Sequence (CES).
- It was designed as a searchable repository for sharing existing and new geotechnical information.
- The shared data concept is a unique and innovative feature of this database.



Loss modelling for TLA's

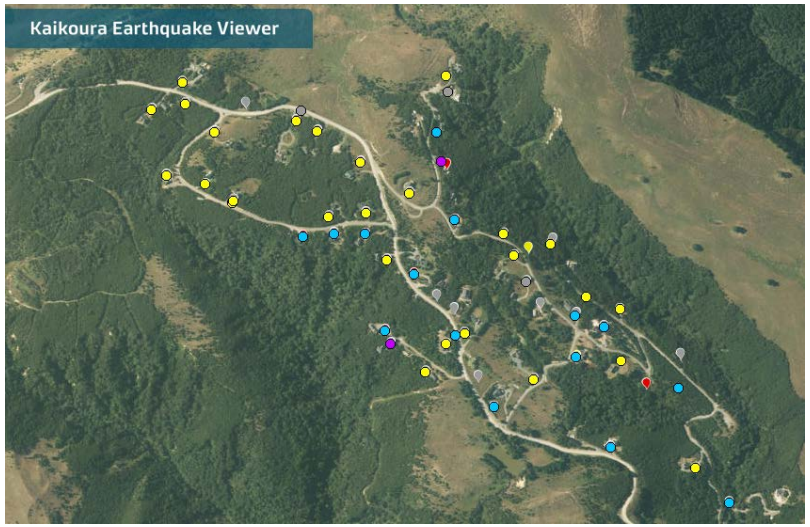
Tonkin+Taylor

Three waters network T+T and AON Probable Maximum Loss estimates

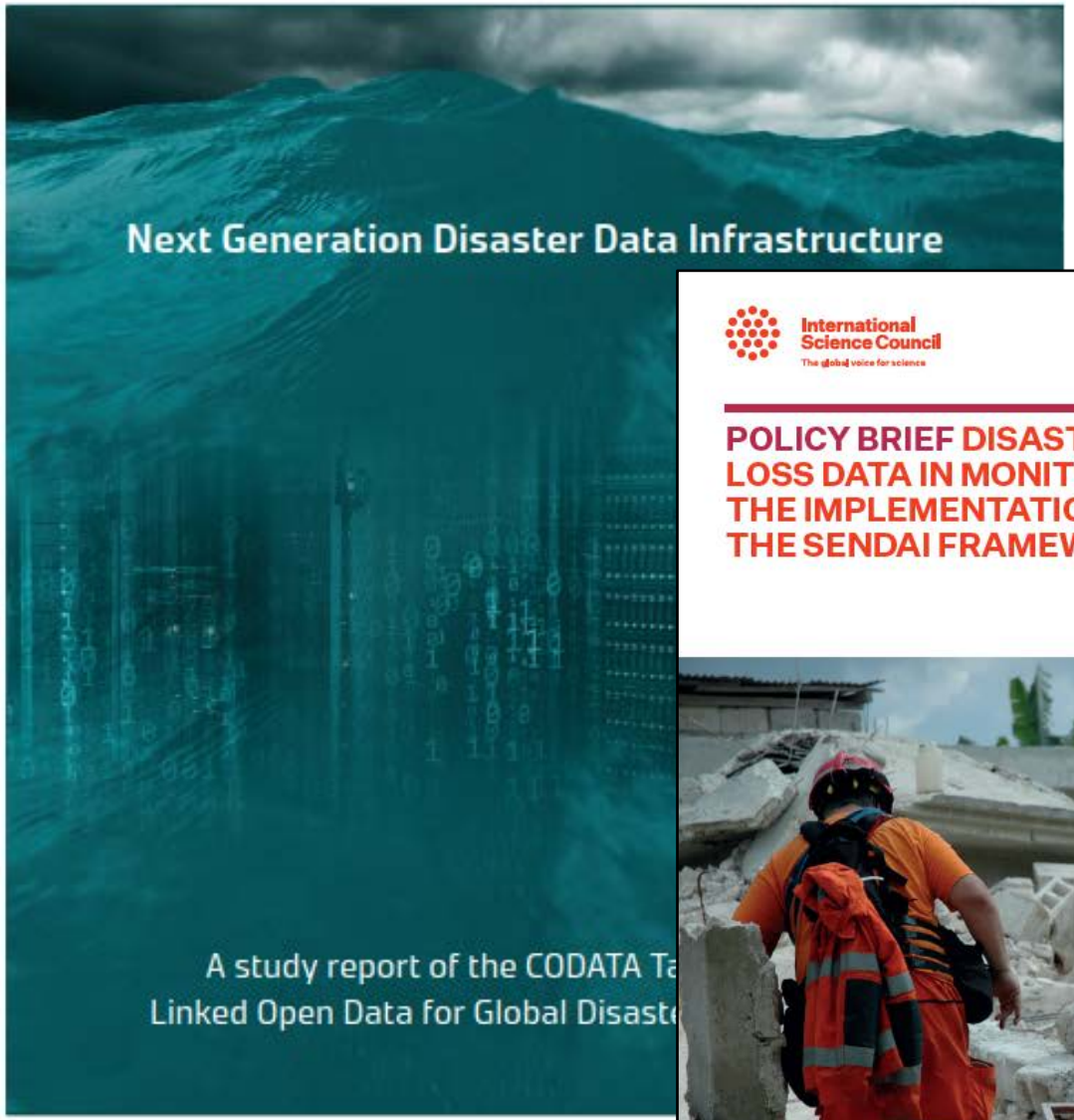


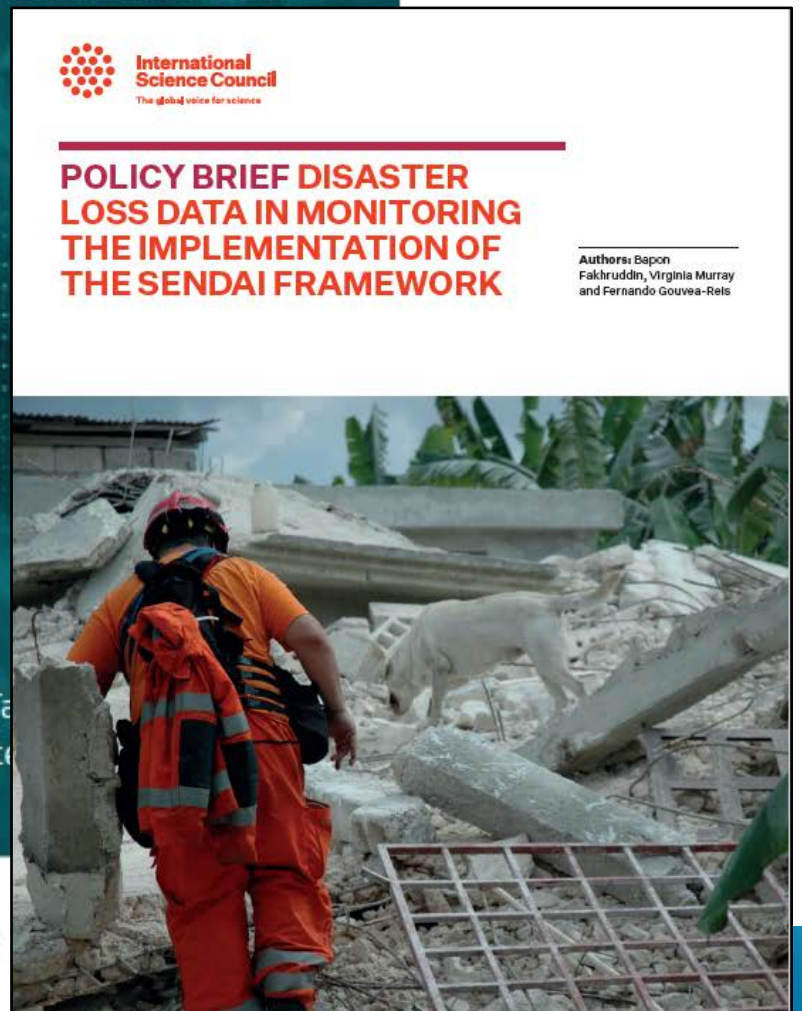
NZ Government - The Kaikoura Earthquake Viewer

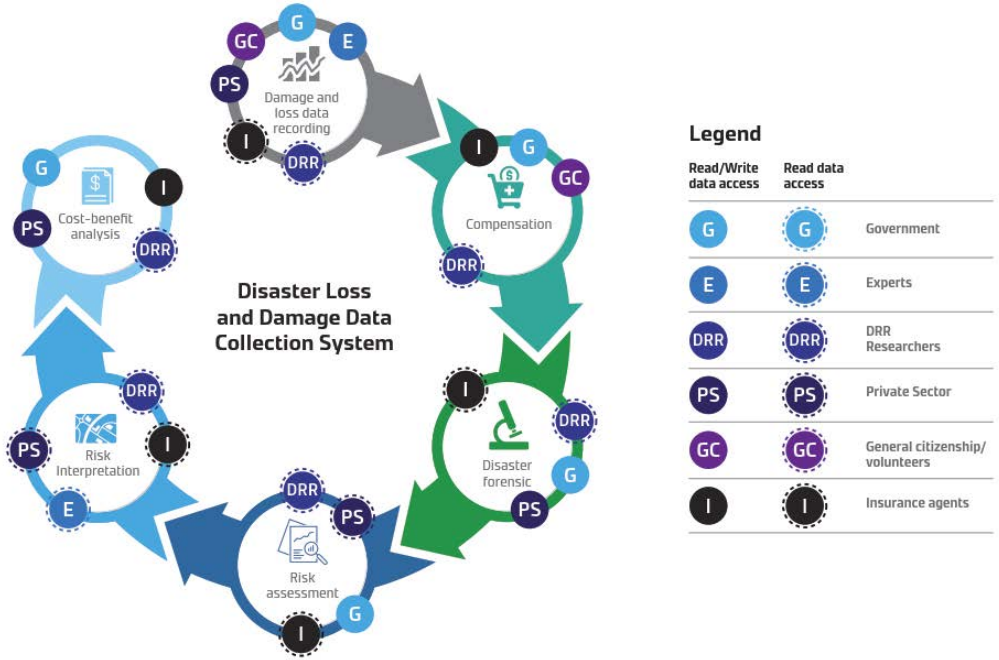
An interactive web map enabling EQC, Private insurance, response and recovery agencies, engineers and researcher users a tailored, secure view of insurer claims for our customers, alongside geospatial event data.



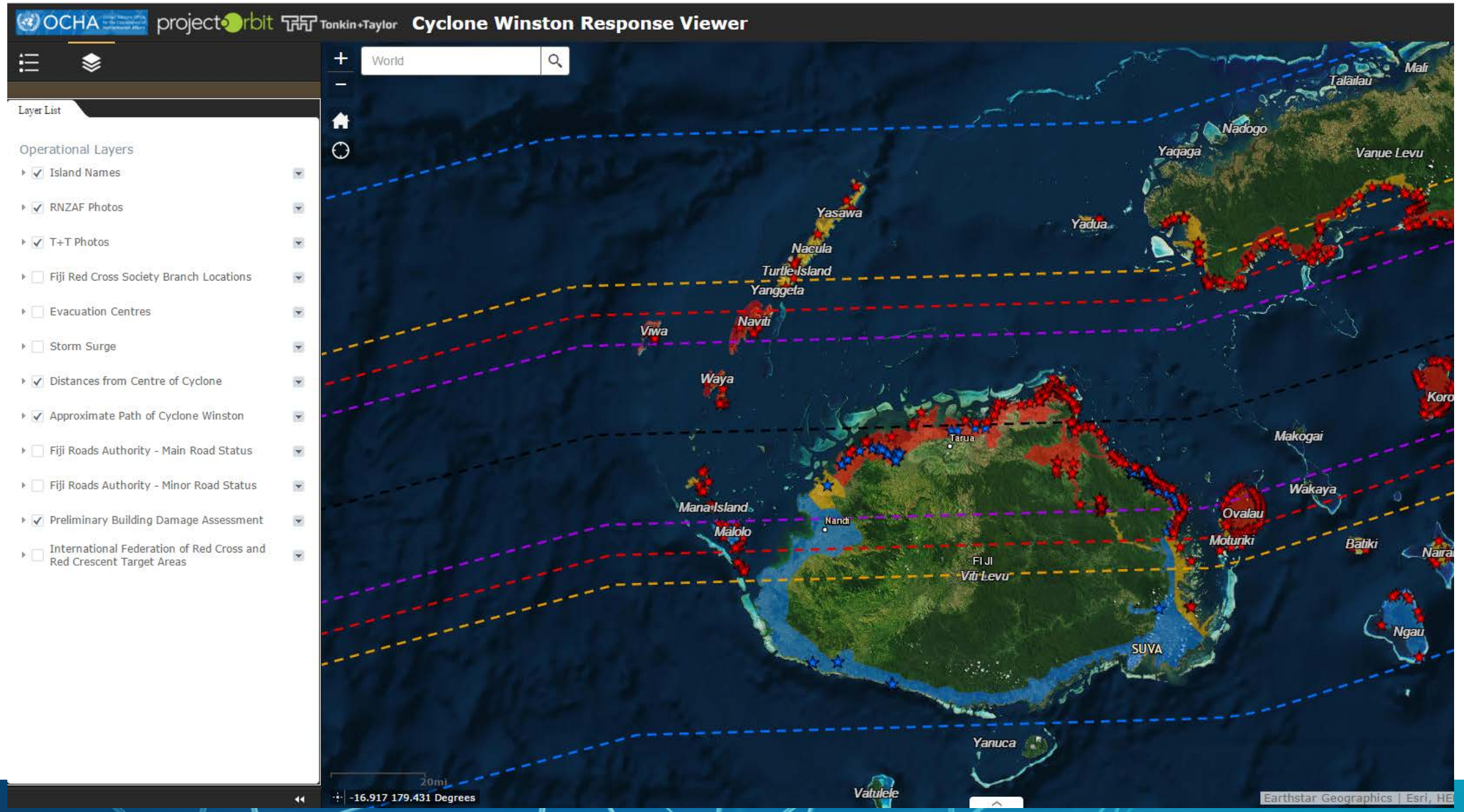
National Disaster Loss Database



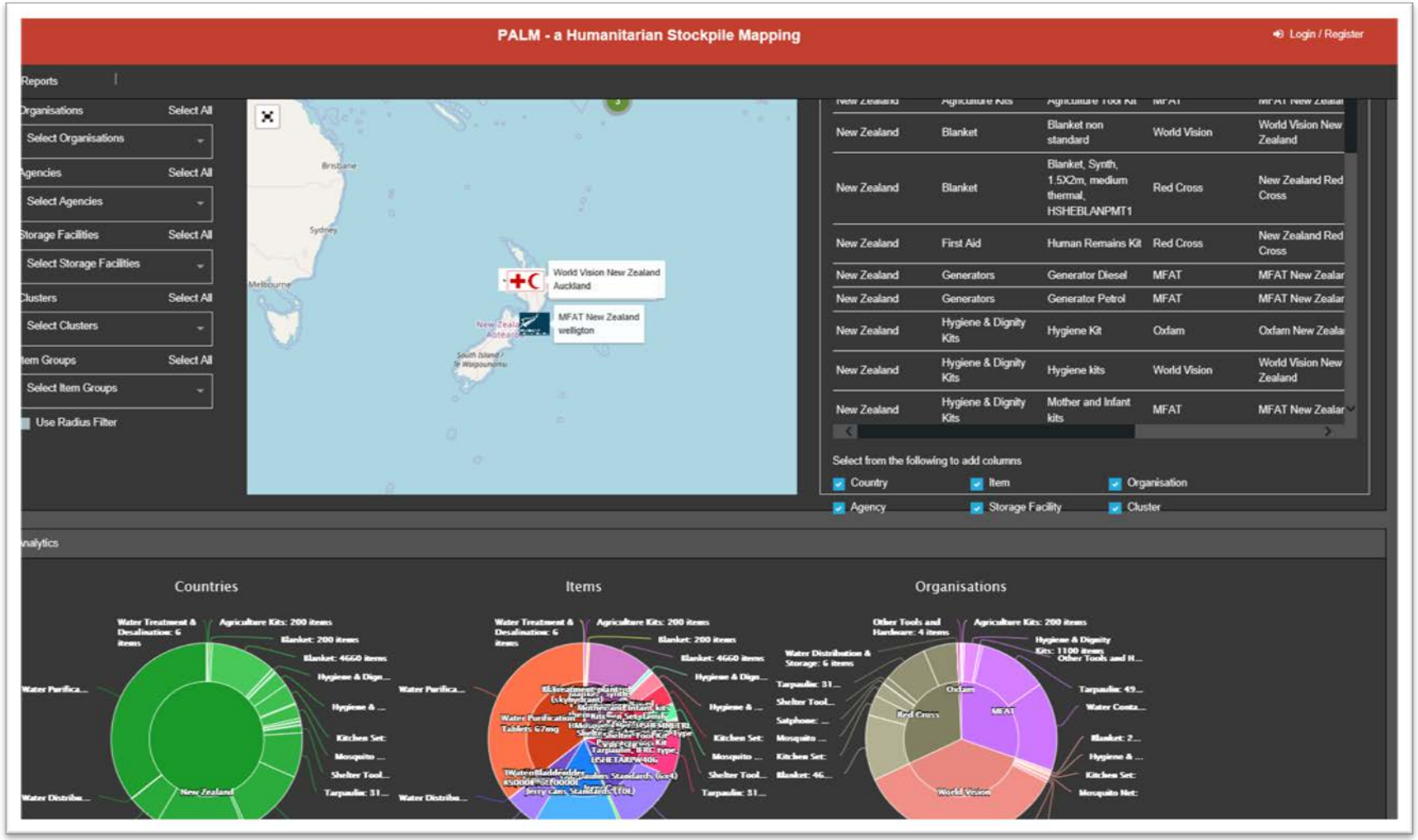




UNOCHA - Cyclone Winston response viewer



World Food Program (Pacific)
Pre-positioned Stock



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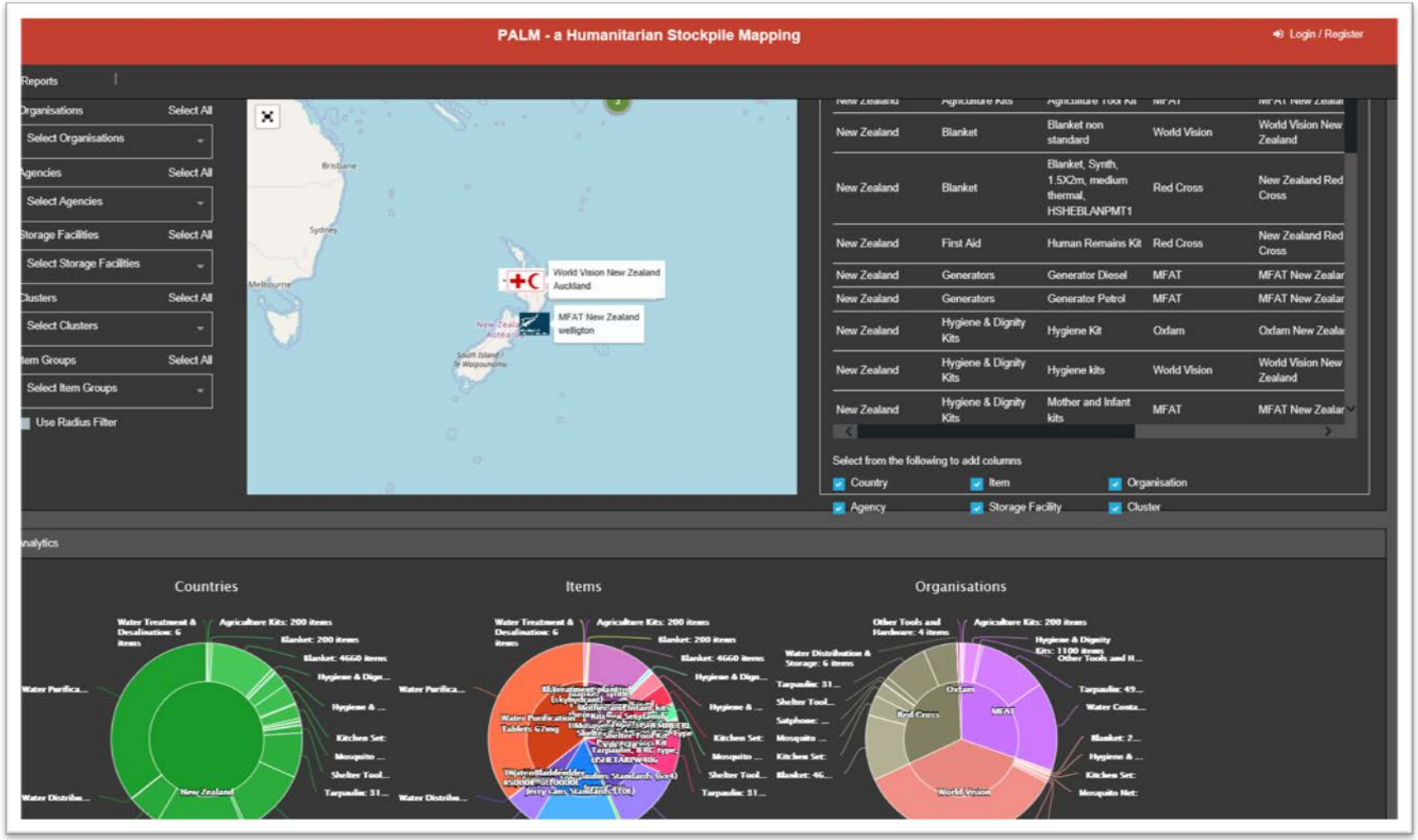
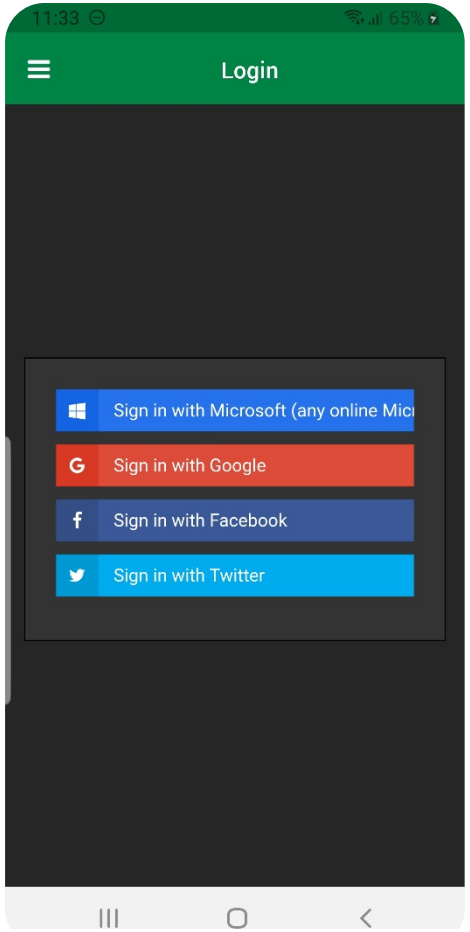
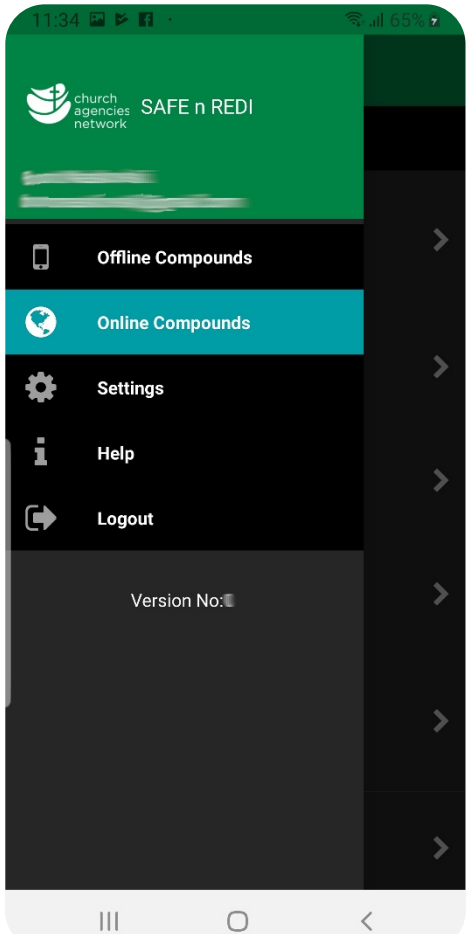
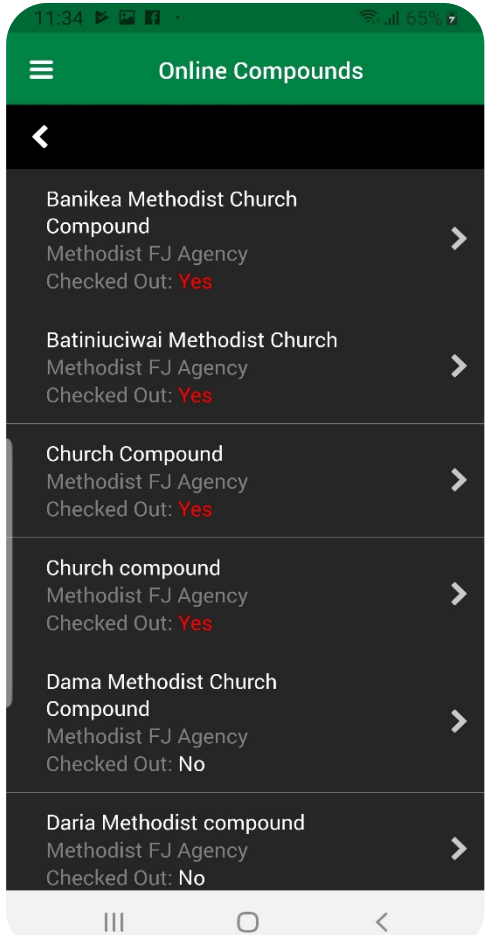
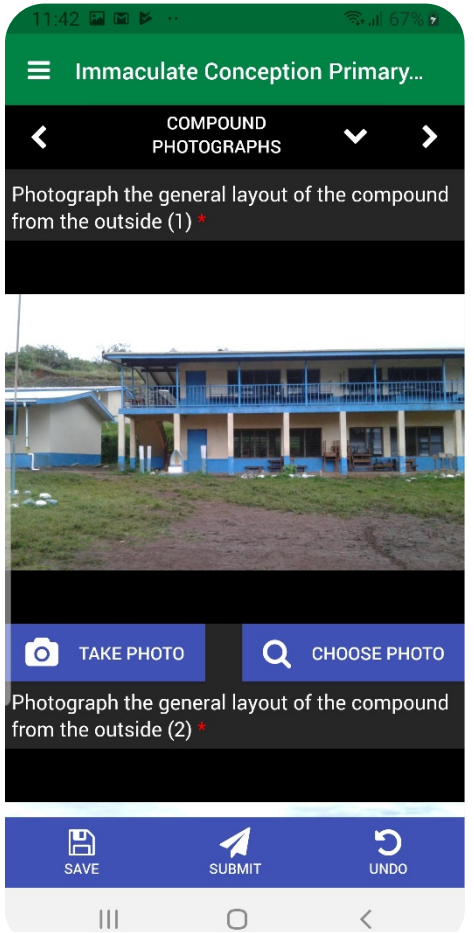


Adventist Relief Agency - SAFE n REDI Phone APP









ESUPS – Welthungerhilfe – STOCKHOLM Prepositioned stock

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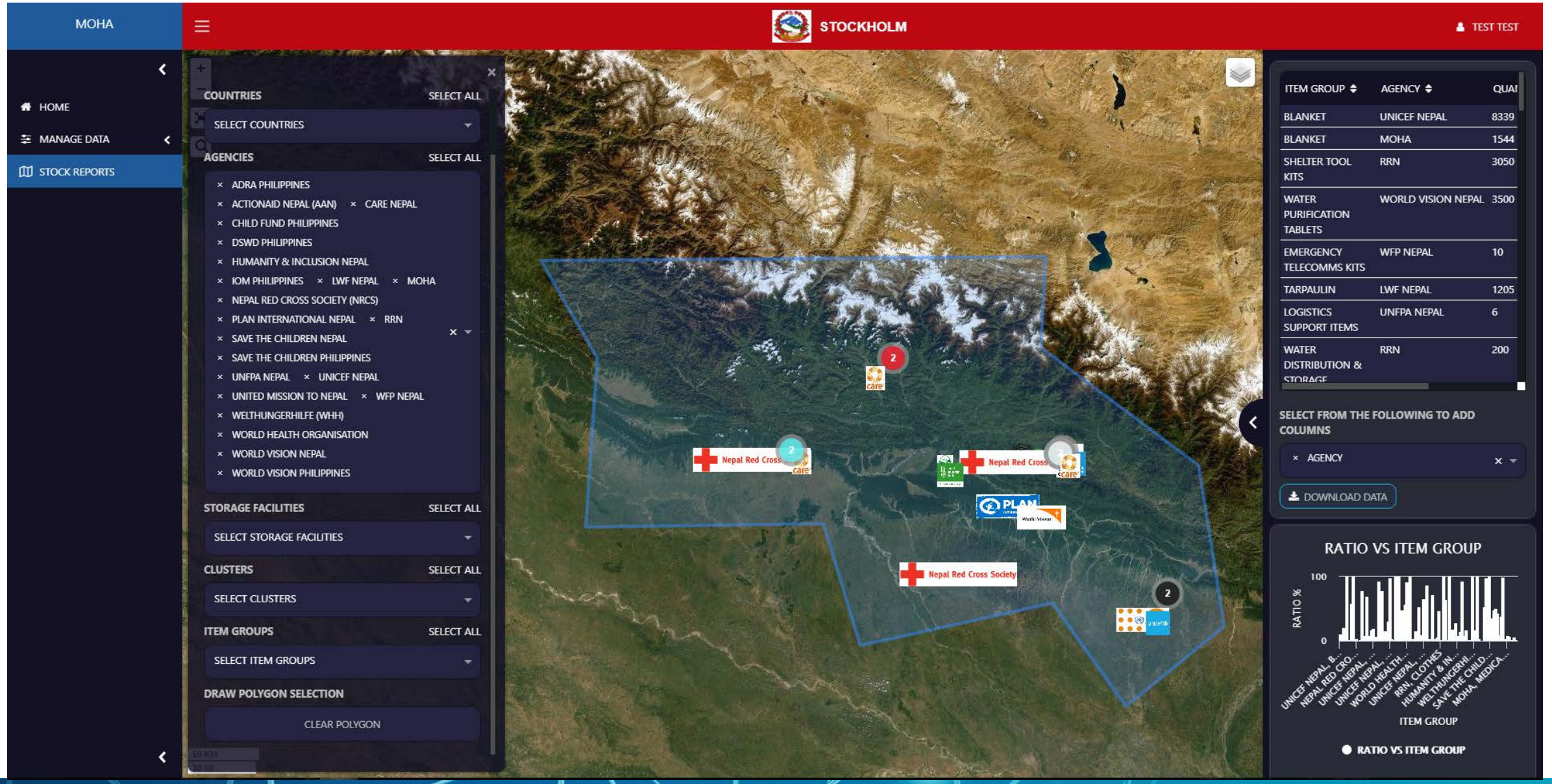


Tonkin+Taylor

Sit up and listen: NZ risks losing billions from rising sea levels

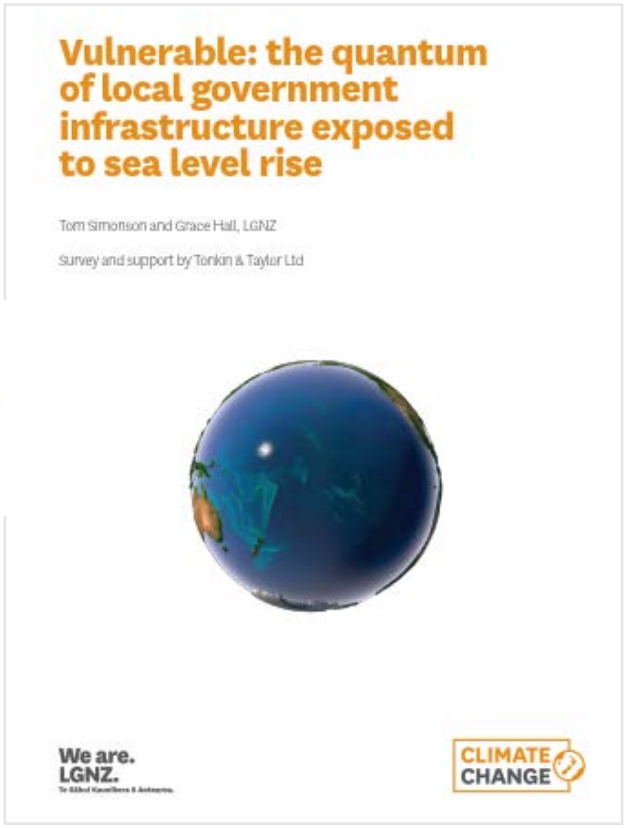
New Zealand sea level rise: Councils' $8b climate change warning

Up to $14b in council infrastructure at risk from rising seas - report

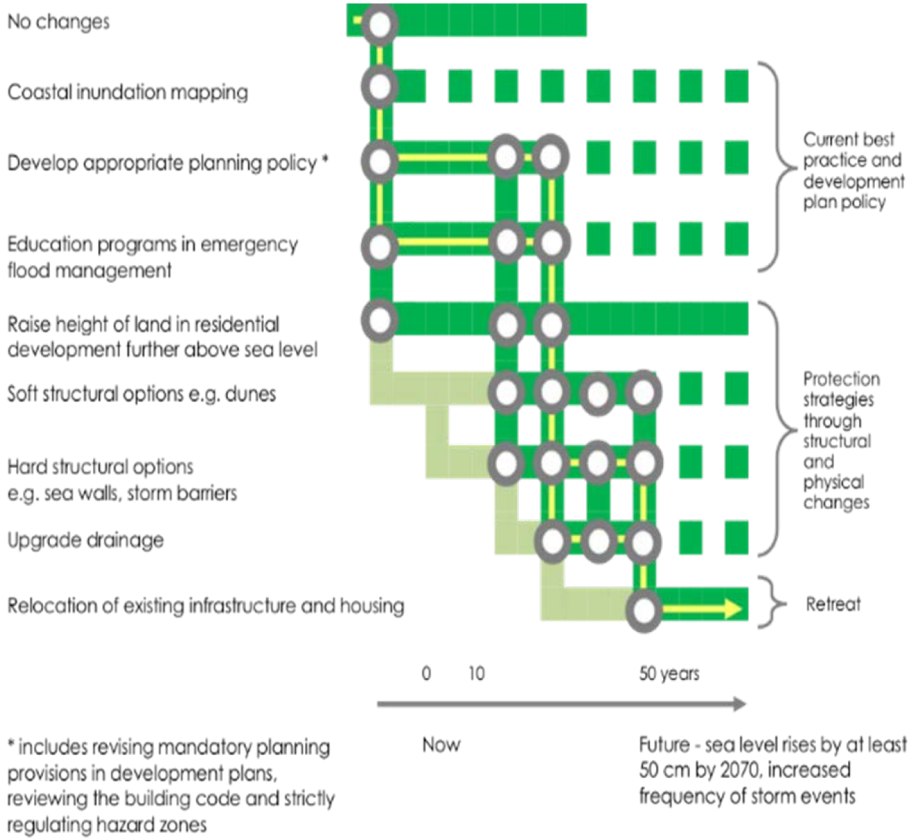
NEW ZEALAND / CLIMATE

Sea level rise could affect $14bn NZ council infrastructure

Sea level rise to cost billions in public service adaptation

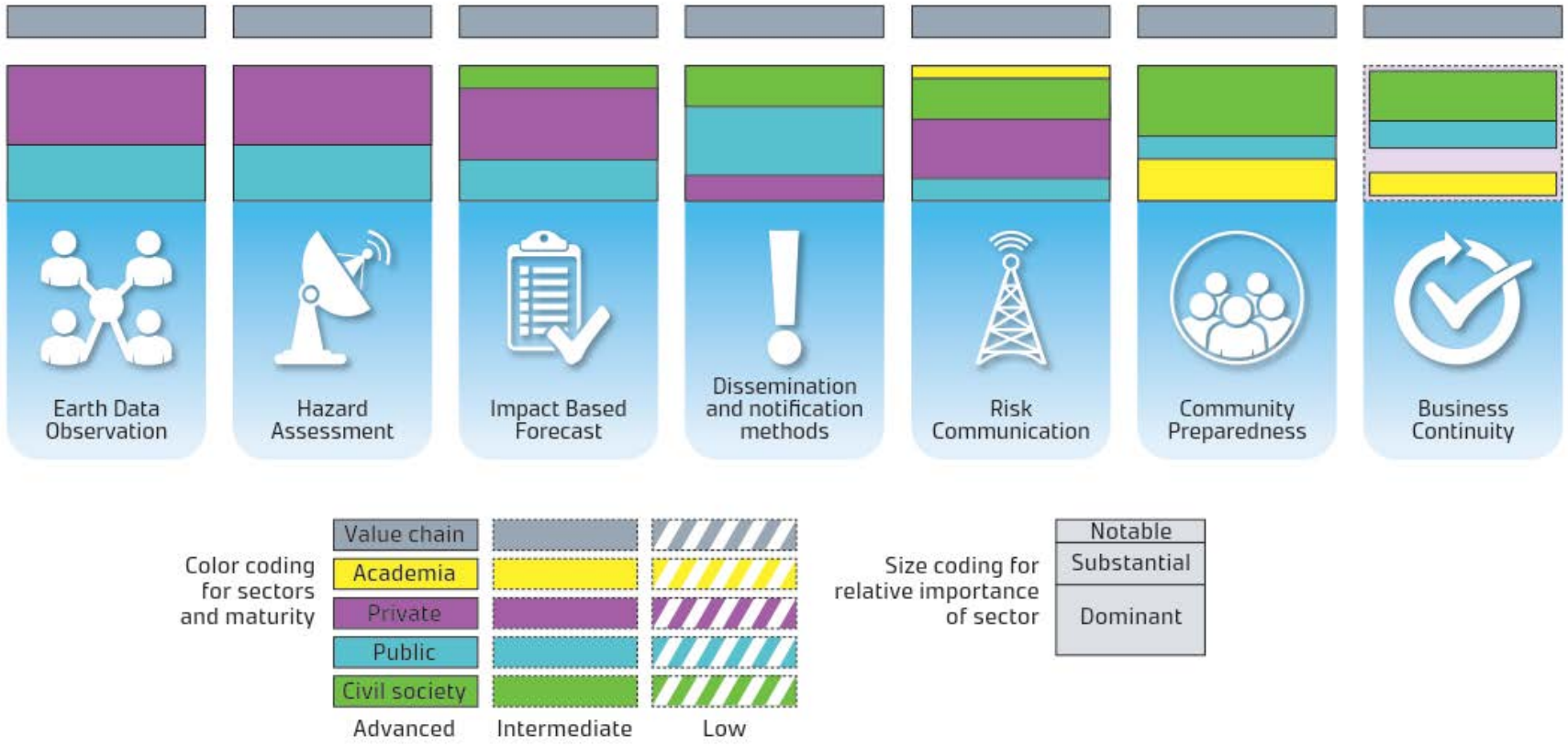


Clifton to Tangoio 2120 Coastal Hazard Strategy

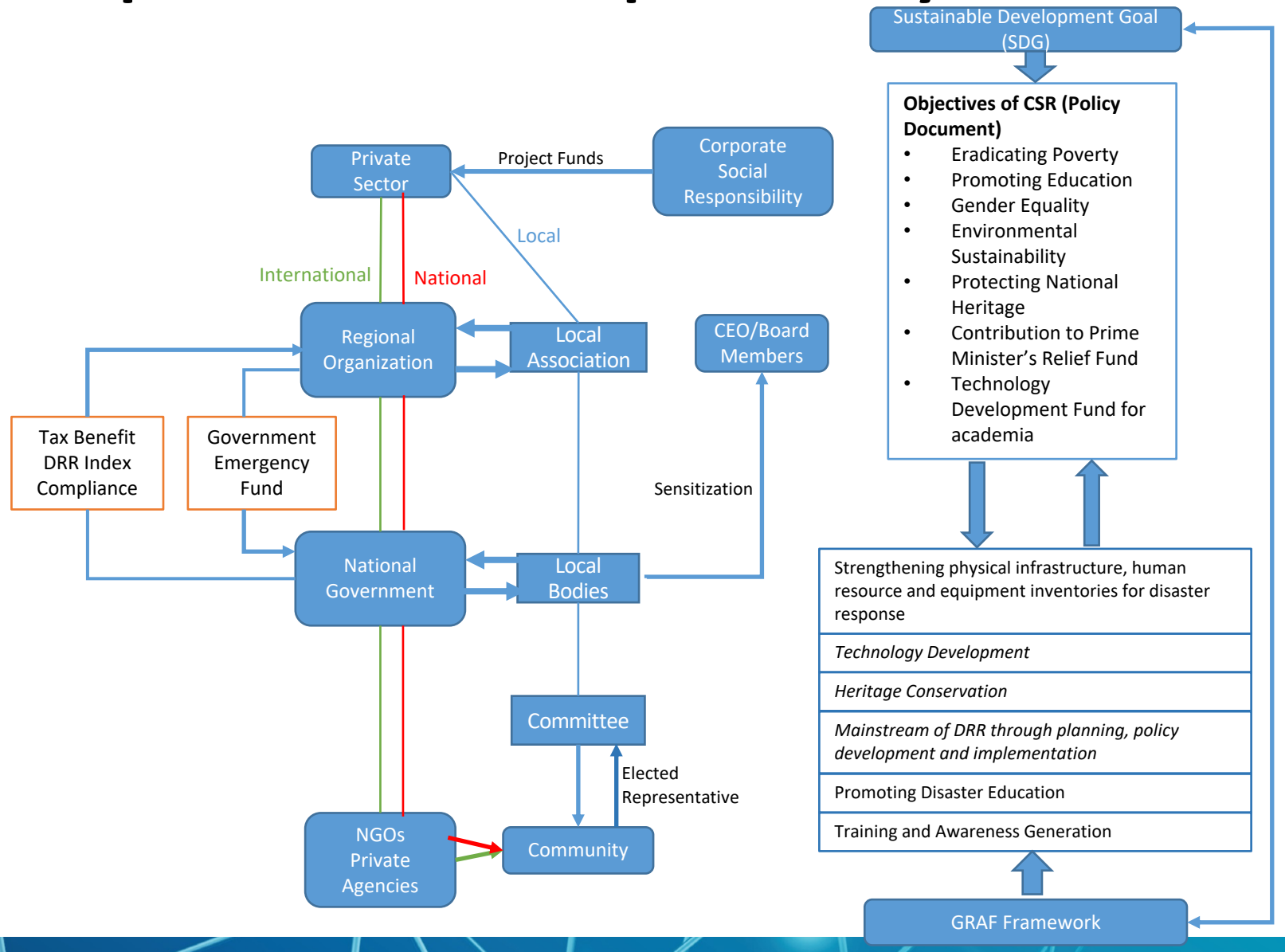


Lessons learned

Sectoral balance and maturity for hydromet value chain- NZ



Enhancing corporate social responsibility



Wat forward

Way forwards

- Good understanding of the benefits of reinforcing EWS by all stakeholders may serve as an incentive in investing and improving technologies.
- Economic assessment and scenario modelling are efficient tools for decision making in respect of investment and technology improvement for preparedness and actions during response.
- Economic assessment of EWS may help in quantifying pre-impact assessment to demonstrate to policy makers the economic benefit of disaster risk reduction.
- Cross-sectoral engagement can be vital for ensuring consistency in the skills and knowledge to carry out forecasting, monitoring and warnings.
- By collaboration and cooperation from local, national and global authorities, increased capabilities and capacities of the National and Hydrological services may lead to cost-effective DRR.
- To strengthen DRR capacity, it is crucial to involve the private sector as major actors in DRR.
- The private sector can contribute enormously to DRR by developing business continuity plans, innovating technology for EWS, and providing and sharing technical knowledge, skills, and resources in the field of disaster preparedness.