

Treaty Village Resilience Project Report

January 2016

1. Introduction

The Treaty Village Resilience Project tests an innovative approach to building resilience and providing support for community development in remote and disadvantaged communities on the PNG-Australian border.

The region was selected as the trial site because of its strategic importance to Australia under the Torres Strait Treaty and the close family ties between the PNG Treaty Villages and the Torres Strait and Cape York region in North Queensland.

The 'change to resilience' framework developed by the project is based on the successful *Land and Sea Ranger* programs in action across northern Australia over the last decade. The experience and lessons learnt from the Australian Ranger programs has informed both the theory and the practical implementation of the Treaty Village Resilience Project.

The Resilience Project was contracted by URS (*Strongim Pipol Strongim Nesen*) on 20th October 2014 and was launched in Daru on 19 November 2104 by the Western Provincial Administrator, Mr Gul Gorgom.

The Resilience Project has received a 20% reduction in funds for the implementation phase; bringing the total investment to \$1.698m + \$162,586 PNG Government taxes and logistics.

The project aims to pilot the delivery of:

- Stronger village level governance and leadership
- Stronger community level skills, capacity and access to learning
- Enhanced food and water security
- Stronger capacity for localised disaster risk management, response and recovery
- Enhanced livelihoods and livelihood skills
- Increased women's participation in decision-making.

The Resilience Project provides a novel approach to community development that focuses on integrating:

- Traditional governance approaches and priority setting into community development to help sustain project outcomes through existing cultural frameworks
- Short-term practical improvements with longer-term systemic changes to deliver sustained benefits
- New *in situ* local skills and appropriate technologies into the development agenda.

2. The Governance and project delivery challenges

The project faces the same governance and project delivery challenges that are well-recognised throughout PNG. Despite the mining wealth of Western Province, the Human Development Index is well below most other PNG Provinces, with the Middle and South Fly Districts being the most poorly developed and under-served. The South Fly District has a Human Development Index of 0.26, equivalent to the Democratic Republic of Congo and one of the lowest globally. The district struggles with the very basic of service delivery, with extremely limited infrastructure and poor law and order. Official accountability is poor and resources are rarely delivered where they intended. As a result, there is limited trust by the citizens in the South Fly District, Western Provincial and PNG governments.

The Resilience Project is being piloted in the coastal region of the South Fly District, which has a history of receiving assurances from government and foreign donors with very few actually delivering. A 'cargo cult culture' exists which has resulted in declining community resilience and capacity to respond to the increasing challenges of natural disasters, breakdown of law and order and failing services and infrastructure.

The communities do not have confidence that the National, Provincial or District Governments will actively address lack of access to economic opportunities and limited access to basic services such as health, education, disaster response and safe transport (there are no roads) in the South Fly District in the short- or medium-term. With little to offer in terms of 'natural assets' to the national agenda, the 'investment attractiveness' by the government into the South Fly District is low. The geographic location on the borderlands between Australia and PNG provides both benefits and challenges for the communities.

Unfortunately, the disadvantage experienced in the coastal region of the South Fly District is often a driver for cross border activity, placing direct pressure on Australia's limited resources in the Torres Strait region. For community development interventions to deliver sustained improvements in access to basic services, there needs to be more than simple improvements in the planning process and governance. The enablers of leadership, *in situ* skills and capacity, law and order and the availability of funds must also be in place. For the South Fly Treaty Villages these enablers are mostly absent, meaning that stimulating demand for services and infrastructure without a realistic pathway to achieving any improvement would only create frustration with no advancement.

Lessons learnt from the northern Australian Ranger programs show that sustained improvements in community development and well-being requires:

- Improving access to better basic services with specific attention on strengthening local governance capacities to prioritise and deliver these services
- Achieving a critical mass of *in situ* skills that enable a community to function as a cohesive unit and engage with the modern economy
- Developing a community expectation for improved leadership and accountability
- Addressing gender inequalities and the safety for women and children.

The 'Community Ranger' approach to developing resilience, focuses on strengthening traditional governance arrangements through a 'bottom-up' process at a village and clan level. These existing traditional structures feed into Ward and LLG planning and governance frameworks but place a 'self-help' obligation on the community.

PNG Traditional communities have the capacity to address these issues through building their internal operational capacity and strengthening their partnerships with the existing government and bureaucratic structures. The Resilience Project aims to address disadvantage and poor service delivery issues at the community level – through sustained and comprehensive engagement with community, clan elders and LLG and District authorities.

The Treaty Village Association

The RRRC has been engaging with the Treaty Villages since 2009, and this experience has resulted in an adjustment to engagement practices. In 2012, the RRRC partnered with the elected Ward members from the 13 Treaty Village to establish and register the Treaty Village Association (TVA), complete with planning, finance and fraud management committees. The TVA petitioned the Western Province and National Government for funds to deliver a development and sustainability project in the Treaty Villages. The successful bid resulted in the Prime Minister, Hon Peter O’Neill travelling to Daru to ceremoniously deliver a PNG Treasury cheque for K19 million to the Provincial government (K3m for the Daru high school and K16m for the Treaty Villages). The member for Leichhardt, the Hon Warren Entsch and the candidate for the South Fly District, the Hon Aide Ganasi were also in attendance. Within a week of the funds being drawn, K9m was re-appropriated resulting in the Provincial Administrator being charged and jailed for corruption.

Local Level Government elections resulted in many of the Ward members being replaced. The founding members of the TVA would not relinquish their positions resulting in the structure becoming ineffective and outside the District governance structure. A considerable quantum of resources had been expended on this process with little gain and limited sustainability.

To deliver future sustainability in governance, the Resilience Project has adopted a ‘Council of Elder’ approach that brought the clan leaders in each village into the community planning and priority-setting processes. The intent is to protect community development and progress from the vagaries of political change that impacts Ward and LLG planning processes.

This experience highlights the weakness of historic community development interventions, where not enough attention is given to effectively supporting service delivery improvements by the community themselves, and with an over reliance on LLG and District processes for implementation. Whilst well intentioned, there was little difference between this early approach and the promises for development that the communities had previously received. Resources and efforts were consumed, however there was very little practical advancement for the communities.

This is a key issue as the communities needed to first experience tangible change to enable the necessary trust frameworks for the governance and leadership conversations to begin.

Over the last 12 months the Resilience Project has invested a significant amount of time and resources in supporting community capacity and planning that underpins the Ward planning process. Once trust frameworks were developed the pilot communities identified the need to

develop greater self-reliance and to make stronger demands for better services from their governments. Each Treaty Village has developed a Community Plan that forms the basis for continuing the Resilience Project activities and further improving community services and infrastructure. Experienced Torres Strait leaders and development specialists worked with the communities to develop the Plans. The Community Plans are signed by all the Clan leaders in each village. The Plans give authority to the Rangers to undertake community service and to carry out the agreed prioritised work plan. The Plans do not replace the Ward Planning process, instead they enable the implementation of high priority activities that have been identified by the community and included within the Ward Plans.

The Community Plans provide for ***community-driven and ranger lead participatory development activities***.

The Resilience Project design does not provide for a pre-determined package of integrated interventions to be delivered in each community. The community (Council of Elders) selects the priorities, the Community Rangers are trained to enable the delivery of these priorities and the community assists the rangers in implementing the services and activities on the ground.



3.0 Project Implementation

The main project approach to facilitating long-term systemic changes is through building the capacity for bottom-up service delivery and stimulating demand for better planning, governance and leadership. This approach in turn should influence the way in which available development resources are allocated at the District and LLG levels.

The *in situ* training of 52 Community Rangers has been a substantial undertaking. Candidate induction occurred in November 2014 and included; health checks, skills assessment, numeracy and literacy training, work readiness training and the establishment of BSP bank accounts in Daru for each Community Ranger and the chaperones.

Once inducted the candidates received specialised training in:

- Community water, sanitation and hygiene
- First aid/first respondent
- Marine craft handling/safety
- Cert small motor maintenance
- Plumbing
- Communication/radio operations
- GPS Navigation
- Workplace Health and Safety
- Computing
- Basic building and design
- Water quality monitoring and reporting
- Standards for agricultural production and supply chain
- Standards in fisheries/seafood supply.
- Basic accounting, procurement and stores control
- Disaster preparedness, contingency planning, emergency response and evacuation plans
- Techniques for compilation and delivery of training packages
- Costing and Tendering
- Leadership
- Accountability

Training occurs at the training facility provided by Mubaduan village. Community Rangers, trainers/mentors are accommodated on site in tents to help reduce the costs of the activity. To undertake such significant activity in Daru would consume almost half of the projects \$1.6m funding through accommodation, meals and security costs alone.

The Community Rangers receive an internationally recognised qualification when they successfully complete each module of the training program. The Community Rangers are now able to deliver community services and infrastructure, and provide planning and leadership support for their Treaty Village communities. This has led to continued improvements to water and food security, health and sanitation, and future livelihood opportunities. The demonstrated benefits for communities of the Resilience Project and respect for the Community Rangers has provided future leaders and a platform for sustainable community development in the long-term.

3.1 Baseline Studies

Undertaken through Australian Government research programs managed by the RRRC. An initial baseline social survey was conducted in 1995 and elements were repeated in 2010 under the Marine and Tropical Science Research Facility (Long 2010). Economic and livelihood surveys were also conducted by CSIRO under the National Environmental Research Program (Busilacchi et al. 2014, Butler et al. 2014). The research partners that form the membership of RRRC provide significant in-kind resources and data to underpin the Resilience Project. In addition, the RRRC through the management of the current National Environmental Science Program has commissioned a repeat of the 2000 Torres Strait water quality baseline study (Haynes and Kwan 2002) to assess the influence of water quality from the Fly River on the marine biota of the region.



3.2 Physical environment – water and sanitation infrastructure.

Through the Torres Strait climate models developed by CSIRO under the National Environmental Research Program (Suppiah et al. 2010; managed by the RRRC) early warning of a pending *El Nino* event allowed the Resilience Project to bring forward implementation of the water and sanitation component to prepare for the upcoming drought. However, the ferocity of the drought and the impact on food security was beyond expectations and has overwhelmed the agenda.

Initial baseline audits of water infrastructure were conducted in each of the pilot villages in 2014 and identified key deficits, maintenance and capacity issues. Community Rangers have completed basic training in plumbing and are competent in most aspects of installing and maintaining water harvest

systems, including tank installation, roof repair, guttering, and downpipe plumbing. Since the audits, the Rangers trained under the Resilience Project have delivered greater than 1.2 million litres of water holding capacity to the pilot villages and a further 90,000 litres to adjacent Treaty Villages not included in the pilot. In addition, six new wells have been dug, each with a life span of 80-100 years (subject to sea level rise and damage from natural disasters). Manual water-lift pumps have been fitted by Community Rangers to three wells to date.

Communities where the leadership responded to the early warnings and focused priorities on water security and preparation (e.g. Mubaduan and Buzi and to a lesser extent Sui), have successfully harvested the intermittent pre-monsoonal storms and now have sufficient domestic supply, but insufficient water for food gardens. Other communities whose leadership did not prioritise water infrastructure, such as Sigabaduru, are still facing an extreme drinking water crisis. This obvious disparity in the successful management of water infrastructure has resulted in community members and Community Rangers becoming very aware of the impact of poor decision-making by leaders.

Smaller communities (e.g. Sui and Buzi/Berr) with fewer Community Rangers have been more successful in harnessing the skills and capacities of other community members, which has resulted in greater pro-rata infrastructure and service delivery. Again, community members and Community Rangers have identified the difference in outcomes from the two approaches.



3.3 Community Health

The Resilience Project recognises that good community health is a pre-requisite to participation in economic, political, and social development. It was therefore important that community health be integrated into project activities. This is of particular importance with regards to women's health and the very high rates of communicable disease including multi drug resistant tuberculosis, HIV/Aids, leprosy, cholera, filarial elephantiasis, gastro-based diseases and malnutrition. Some of the communicable diseases are selectively impacting women and children.

The working relationship between the Daru Hospital and the Resilience Project has been mutually beneficial with two Daru Hospital nurses delivering extensive women's health and general health training to the female rangers. In response, the female rangers support health officers in the pilot villages in delivering emergency first aid.

All 52 Community Rangers have completed and are competent in first aid/first respondent training (standard HLTAID003) with the addition of relevant elements of HLTFA302C Remote Area First Aid.

Elements of skills competency Included:

- Principles of first aid
- Examining a casualty
- The chain of survival
- Emergency action plan
- Managing the unconscious casualty
- Airway management
- Rescue breathing and chest compressions (adult, child and infant)
- First aid hygiene
- Assessment of an emergency situation
- DRSABC (Danger, Response, Send for Help [in this context a community health worker], Airways, Breathing, CPR – but no D for Defibrillation)
- Managing shock
- CPR techniques on adults, children and babies
- Basic physiology and anatomy
- First aid procedures for bleeding, burns and fractures
- Managing medical emergencies such as snake/spider bites, poisons and choking
- Managing medical conditions such as anaphylaxis, asthma and seizures
- Infection control procedures
- Managing exposure to extreme temperatures
- First aid for eye and soft tissue injuries
- Assessing and moving the injured or ill
- Managing the unconscious casualty
- Controlling bleeding
- Managing other life threatening situations, including assisting delivering mothers for childbirth until/if they can be attended by a community health worker
- Identifying (seeking medical assistance) for postpartum complications from child birth
- Preparing for isolated travel or work, accounting for expected contingencies
- How to develop a response plan appropriate to your circumstances, location and the casualty's condition

- Options for transporting casualty, considering environmental conditions, transport availability and casualty's condition
- Cultural awareness issues
- Monitoring casualty's condition and undertake ongoing first aid procedures as required
- Providing emergency survival elements at a remote incident site (shelter, water) in accordance with environmental conditions.

Skills elements that were excluded (as deemed inappropriate given the context of a Treaty village):

- Using an Automated External Defibrillator (technology not available)
- How to establish communication links to medical services, including RFDS (limited communications apart from a mobile phone in some locations only)
- Administering medication under direct instruction from an authorised health worker.

This comprehensive training has provided all 52 Community Rangers with the knowledge, skills and confidence to assist with routine medical care and respond to emergency situations. The Community Rangers responded to over 90 emergencies between October and December 2015, and have individually reported on each emergency.

The Community Rangers have developed communication products and delivered community health training to 6 villages (> 4700 people) in English, Kawai and Agob languages. In partnership with Queensland Health, the Community Rangers have conducted three specialised TB awareness training events in Sigabaduru, Mabaduan and Buzi/Berr to >500 community members, and specific TB home nursing training has been provided for women groups in Mabaduan and Sigabadudu.

The Resilience Project has attracted further activities in the community health area by supplying support service to Queensland Health Staff, who delivered TB awareness training and specific TB home nursing information in the pilot villages. This work was directed through the female Community Rangers who provided access and language translation to women's clan groups. This is extremely important as females between 20-40 make up the majority of new multi-drug resistant TB cases due to their role in home nursing TB patients in the South Fly District. In addition, the Community Rangers have been contracted by DFAT to refurbish the existing Mabaduan Hospital to enable outreach health service from Daru Hospital to be delivered prior to the completion of any new hospital facilities in the Treaty Village area.

3.4 Women empowerment & gender sensitive participation

While there remain significant barriers to women's active and equal participation in decision-making in the Treaty Villages, the Resilience Project allocated 12 Community Ranger positions specifically for women. The project also engaged two female chaperones to enable the women to attend the training sessions and two local female medical staff to assist with training and mentoring. Low levels of literacy, obligations to the family and cultural issues were placed as initial barrier to female inclusion. However, after much negotiation female candidates from the pilot villages were selected by clan elders and inducted into the training program. Female candidates undertake the same training as the men including boat training, first aid, building, communications, small motor maintenance and plumbing. They also undertake additional training in women's health. Their inclusion in the Resilience Project to date has brought considerable benefit to the communities. For example, the female community

rangers assisted during the water crisis by attending water collection points and training local women in water purification and disease management. This in turn significantly reduced the reliance on the Torres Strait medical facilities during this period. The female rangers also play a significant support role for the health workers in each of the communities particularly in child birth and postpartum care. Their success and the appreciation by community members has resulted in the female Community Rangers having a greater participation in village meetings.

The fact that the Community Rangers are speaking out about gender equity and family violence is an important factor in influencing the broader communities' attitudes towards gender equality. The Resilience Project is providing strong female role models and remains the only real source of information to counter cultural norms which promote male dominance in household and community domains.

The female Community Rangers have developed an anti-family violence narrative based on the reality that if a woman is beaten then she is unable to look after the children or undertake village work. Therefore, *beating your wife is an act against the whole village and pulls the village down*. The male Community Rangers have adopted this narrative and represent a serious gender, enabling group. The male Community Rangers are held to the highest standards as community mentors. If a Community Ranger commits family violence or other unsavoury conduct, he loses his job as a Ranger, which will bring shame to his Clan and reduce his family's income. Male rangers are also called upon to ensure that the female Community Rangers are safe at all times when visiting other villages or Daru.

The Resilience Project aims to progress female empowerment through creating awareness of, and supporting the role women play in their communities and ensuring that women are represented and meaningfully involved in community structures and decision-making.

3.5 Disaster Risk Reduction

The Torres Strait and South Fly District are recognised internationally as a hot spot for climate change and increased natural disasters. There has been significant sea level rise (highest astronomical tide increase estimated at 52cm since 1920's), and more frequent extreme rainfall events – drought and flooding. These natural disasters are predicted to increase in intensity over the next 50 years (Suppiah et al. 2010). Natural disaster impacts combined with communicable disease outbreaks (e.g. cholera, multi-drug resistant TB) are a significant driver of cross border instability.

Disaster risk reduction plans and response training are a significant component of the Resilience Project. The four safety vessels and equipment such as shovels and chainsaws make up part of the village disaster response facility. Early warning and prior preparation are the key to building community resilience. Baseline studies conducted in the Torres Strait on traditional coping mechanisms are utilised along with focused planning and broader community training.

Draft Disaster Preparedness Plans have been developed as part of the Community Plans for each of the pilot villages, and Community Rangers have been trained to implement the plans. While the Treaty Villages will respond as a unit to a disaster, coordination with District, Provincial and National Disaster Response frameworks has been limited to date.

4. Monitoring and Evaluation

The Resilience Project has established a robust Monitoring and Evaluation (M&E) approach that provides both quantitative and qualitative metrics. The initial baseline infrastructure surveys provide the evidence for practical progress by the Resilience Project and Community Ranger progress can also be mapped against the work plans in each Community Plans. This evaluation approach allows for a comparative analysis of the effectiveness of different leadership approaches in tangible outcomes for the community. Qualitative and observational analysis can be made between pilot villages and others that have not received intervention from the Resilience Project. A quantitative analysis report is expected toward the end of the project in mid-2016.

As part of the administrative training for the Community Rangers and as a measure of progress, the Rangers are required to report on their activities. This reporting is comprehensive, and includes:

- Detailed reports on each first aid/medical emergency attended
- Detailed reports and photographs participants attending the community training session. This also provides a 'head count' of community members receiving training from the Rangers
- Detail reports of infrastructure work (installing tanks, digging wells) achieved independently of project mentors with supporting photographs for verification
- Written report on issues and impediments and suggestions improvements in the future.

These reports are collated and included in the general project reporting. The responsibility of reporting and evaluating performance is embedded as part of the overall leadership training. Accuracy and integrity in reporting is an essential element for each of the villages. The Project utilises transparency as part of fraud management, reinforcing the understanding that the Resilience project can only achieve so much because no one is stealing the money. The Community Rangers also verbally report to the Council of Elders in each pilot village on their achievements against the work plan. Where the village leadership is weak, achievements against the work plan are reduced, and this outcome is transparent.

In terms of information sharing, review and learning activities, the Community Rangers regularly meet with mentor/trainers and analyse progress and challenges.

The RRRC utilises the Australian Government M&E system and holds appropriate data in a number of formats. RRRC also holds relevant data from other Australian Government program relevant to the South Fly District. This information is publicly available.

5. Communications

The Resilience Project has a structured communication protocol with Treaty Villages and the District Administration and associated agencies. Regular briefings are given to update the District Administrator, District Treasurer, Police, Customs, Border Development Authority and Daru Hospital (when possible).

The sharing of information has helped the Resilience Project overcome considerable scepticism about the project objectives. Many community members believed that the intent of the project was to prevent the harvesting of dugong and fisheries resources by Treaty Villages, or some other enforcement activities. These misconceptions have been addressed and the work of the Community Rangers now receives community support and regular coverage in the local and national newspapers. The District Administrator displays the articles in relation to the activities of the Community Rangers on his wall, which are regularly updated by his staff.

Collaboration with other institutions and potential partners is principally through the annual Traditional Inhabitants meeting of the Joint Advisory Committee of the PNG and Australian Torres Strait Treaty. Updates are presented to the attending PNG and Australian government agencies. Given the rapid progress of the Resilience Project, the information supplied has been well received and opportunities to integrate with other Australian Aid funded projects are also identified.



6. Innovation

The entire Resilience Project methodology reflects classic ‘participatory action research’, with an emphasis on **community participation and action**. The approach utilises collective inquiry and experimentation grounded in experience and social history. In addition, there is scope to facilitate other types of research and innovation in the delivery of the project. It is clear that innovation opportunities exist for: more functional water capture and storage, sanitation, alternative energy supply, food production and storage, fish attractant structures and low input aquaculture. These areas are being explored by RRRC research partners, including the availability of appropriate technology for the project.

The trialling of innovative water capture, storage products and sanitation systems is already well advanced in the pilot villages. If successful, these innovations will revolutionise water systems in remote rural communities that are difficult to access.



7. Value for money

To date, an analysis of actual expenditure highlights the investment in the initial training and platform for implementation. The initial higher expenditure on trainers/training has given way to implementation costs.

- Personnel costs as a percentage of overall budget are 40.5%
- Operational costs as a percentage of overall budget are 54%
- Administration costs as a percentage of overall budget are 5.5%

Personnel costs have accounted for 40.5% of the total expenditure to date. Of this, about half was spent on contracted trainer/mentors and experts; and just less than half on the Community Rangers; consultants and there has been very constrained expenditure on administration (recognising that most has been expended on independent financial audit).

Given the high costs of staffing in-country and it is not unreasonable that personnel costs constitute the largest single component of expenditure. There are 52 Community Ranger, 2 chaperones, 10 trainers/mentors/experts (8 expat, 2 female nationals), 4 cooks/kitchen staff, 2 guards and 2 administration staff + consultant financial audit.

Overall to date the cost of delivering the Project have accounted for around 94.5% of total expenditure. Program Delivery includes: direct project staff costs (local and expat staff; project staff travel costs; communications; vessels and equipment; PNG import tax; direct PNG government charges; fuels etc.).

With the 20% reduction in funding for the implementation phase of the project, all efforts are being made to further reduce administration cost and maintain delivery on the ground. However, work on implementing the livelihood component of the project will be significantly reduced.

The high expenditure on materials for development and new infrastructure, raises the question of PNG government investment. Through an MOU, the Resilience Project has been able to leverage nine water tanks and two birthing beds from the PNG Border Development Agency. In addition, the South Fly District Administration has offered K1m of the remaining K7m that the Prime Minister presented in 2012. If these funds are ever released they will be utilised in the purchase of cement, materials and equipment to further strengthen community resilience to drought in the non-pilot villages.

8. Impact and sustainability

In summary, the most significant improvements in community well-being and resilience to date include:

- Significant increased water capture and storage capacity (1.2 million litres in pilot villages and 90,000 litres in non-pilot villages) and long-term increased access to water supply (water wells).
- Building a critical mass of 52 trained Community Rangers with capacity to deliver services into the Treaty Village communities. These are the leaders of the future and with leadership and governance training present a pathway to strengthen the social and economic fabric of the Treaty Villages.
- Four draft Community Plans (including work programs and disaster response plans), which reflect the agreed priorities of all clan groups in the Treaty Villages and are less vulnerable to political changes.
- A culture of safety and infrastructure maintenance has been introduced into the pilot villages.
- The highlighting of the value of good leadership and governance through tangible outcomes.
- Reduced family violence and improved gender equity that are openly supported by both male and female Community Rangers, resulting in a greater empowerment for women and opportunities to participate in decision-making and service delivery at the village level.
- Improvements in community health understanding and reduction in water-borne diseases.
- Increased disaster/emergency response capacity in pilot villages and assistance to marine disasters (more than six rescues at sea performed to date)
- Establishment of a safe and reliable platform of service delivery enabling future 'fee for service' businesses to be developed (e.g. for Treaty Awareness visits, biosecurity, research and health services)
- Livelihood training for Community Rangers who are competent in preparation and costing of service tenders. There is also an audit of village skills and equipment to identify opportunities for the villages to compete against external tenderers for the delivery of service contracts that have been let by the District Administration or donor agencies
- Improved 'work readiness' of Community Rangers through the skills training and qualifications acquired, which enables access to employment opportunities in PNG or internationally.

References

Busilacchi, S., Butler, J.R.A., Skewes, T., Posu, J., Shimada, T., Rochester, W. and Milton, D. (2014) Characterization of the traditional artisanal fisheries in the Torres Strait Treaty communities, Papua New Guinea. CSIRO Oceans and Atmosphere Final Report, Cairns (112 pp).

Butler, J.R.A., Bohensky, E., Skewes, T., Maru, Y., Busilacchi, S., Rochester, W., Katzfey, J. and Wise, R.M. (2014) Drivers of change in the Torres Strait Region: Status and trends. Report to the National Environmental Research Program. Reef & Rainforest Research Centre, Ltd., Cairns (39pp).

Haynes, D. and Kwan, D. (2002) Trace metals in sediments from Torres Strait and the Gulf of Papua: concentrations, distribution and water circulation patterns. *Marine Pollution Bulletin*, 44, 1296–1313.

Long, S. (2010) Traditional knowledge is facilitating climate change adaptation in Torres Strait. Synthesis Report prepared for the Marine and Tropical Sciences Research Facility (MTSRF). Published by Reef & Rainforest Research Centre Ltd., Cairns (14pp).

Suppiah, R., Bathols, J., Collier, M., Kent, D. and O’Gracy, J. (2010) Observed and Future Climates of the Torres Strait Region. Report to the National Environmental Research Program. Reef & Rainforest Research Centre, Ltd., Cairns.