

Chapter 14

Climate change

14.1 Throughout this report, the committee has referred to current and potential adverse effects of changes in climate on the ecosystems in the Torres Strait. The committee discussed the possible detrimental effects on the life cycle of protected or vulnerable species and the likelihood of increased risks of noxious weeds, pests and diseases spreading into the region. It also considered the implications for national security, should food or water shortages create tensions between people or communities who are forced to re-settle because their local environment can no longer sustain them. The effects of changes in climate in the Torres Strait therefore are not confined to a specific island, animal or plant species, or community. Moreover, the knock-on effects for conservation, biosecurity and national security are little understood.

14.2 In this chapter, the committee consolidates its consideration of the effects of climate changes in the Torres Strait, starting with the more immediate concern of events already occurring due to sea water inundations and coastal erosion. It then pieces together all the numerous aspects of climate change covered in the report to reach a more comprehensive understanding of the significance of these changes and the steps being taken to address the possible short and long-term implications for the region.

Immediate problems

14.3 At present, coastal erosion and inundation are affecting settlements, wildlife habitats, land use, beaches, harbour and coastal works, business, ecosystems and important cultural sites in the Torres Strait Islands. The worst affected communities include Boigu and Saibai, the two most northern islands just across from the PNG border. The central coral cay islands of Warraber, Masig, Poruma and Iama are also subject to significant erosion and inundation.

Recent events

14.4 Local people informed the committee during its visit to Saibai and Boigu about recent sea water inundations and the subsequent major flooding. Ms Morris advised the committee that the highest astronomical tides that occurred in January 2009 and 2010 were related to cyclonic or low activities in the gulf. She explained further:

...the high tides always come with those monsoonal activities, be it a cyclone or just a large low. We know that the sea level was 52 centimetres higher than the predicted highest astronomical tide level and we suspect that this year, when all the data is completed, we will be looking at similar spike periods. So it is not the four centimetre sea level rise that you hear people talk about; it is these spikes that come through that have the bigger

impacts. That changes a whole lot of systems, including the ecological systems and some of the breeding systems of some of the species.¹

14.5 As noted in earlier chapters, rising sea levels and more extreme weather events have the potential to affect every aspect of life in the Torres Strait—eco-systems and the wildlife they support; food and water supplies; the health and well-being of local people; land use; and patterns of human settlement. During the committee's visit to Boigu, Councillor Donald Banu spoke of the changes taking place on his island. For example, he noted that the birds that used to be in the swamps now walk the streets. He recalled a time when their fathers knew when to plant crops but changes in climate were now outside their understanding of normal fluctuations. The committee also saw evidence of coastal erosion on Saibai and Boigu and heard first-hand accounts of the severe effects of the January 2009 and 2010 inundations. It was told that Saibai once had a beach but this foreshore was now lost.



Shoreline erosion on low lying islands in the Torres Strait

1 *Committee Hansard*, 25 March 2010, p. 33.



(Photos courtesy of the Torres Strait Regional Authority)

The damage caused on Saibai by recent sea water inundations and major flooding

14.6 Whether the sea water inundation is caused by climate change or unusual weather events, Ms Morris argued that it is occurring and causing problems on Masig, Yam, Saibai and Boigu and nearly all the low-lying islands in the Torres Strait. Scientists are seeing fundamental change, such as sand accretion, in these islands, and the mud islands of Saibai and Boigu, in particular, are 'in a lot of trouble'.²

14.7 Because the land and seascape is central to the cultural and social life of Torres Strait Islanders, changes in climate may also affect profoundly the cultural heritage of the people. A 2008 Native Title Report found that the threats to culture from climate change were 'already being felt' and gave the examples of king tides damaging graveyard sites and the disruption to nesting behaviour of turtles. It surmised that if predictions were accurate, some islands may 'disappear completely' and others 'lose large tracts of land', with the possibility of Islanders being disposed of their lands and forced to relocate. It quoted an Islander from Saibai who said 'But we will lose our identity as Saibai people if we scatter. If we separate, there will be no more Saibai'.³ During its visit to Saibai and Boigu, the committee heard similar views about the importance of preserving the island culture and the strong resistance to any suggestion regarding relocation.

14.8 Islanders are looking at practical measures to deal with the immediate problems of sea inundation. For example, the people of Masig have stated clearly their wish 'to continue live on Masig into the future'. They are prepared to participate in a process of adaptation to environmental change by, among other things, gradually moving the focus of the island village towards higher parts of the island' and building new houses and infrastructure away from hazardous locations unless absolutely essential.⁴

14.9 To manage the uncertainty about climate change and its effects on island environments, in 2006 the TSRA established the Torres Strait Coastal Management Committee (TSCMC). Its initial brief was concerned with coastal erosion issues; but has broadened its scope to include tidal and storm surge inundation and projected climate change impacts on island communities. The TSCMC includes representatives from communities currently most affected by coastal erosion and tidal inundation—Saibai, Boigu, Poruma, Masig, Iama and Warraber. It also includes representatives from local, state and Australian governments and from research institutions.⁵

2 *Committee Hansard*, 25 March 2010, pp. 33–34.

3 Australian Human Rights Commission, *Native Title Report 2008*, Case Study 1 'Climate change and the human rights of Torres Strait Islanders', p. 245, http://www.humanrights.gov.au/social_justice/nt_report/ntreport08/pdf/casestudy1.pdf (accessed 8 January 2010).

4 Australian Human Rights Commission, *Native Title Report 2008*, Case Study 1 'Climate change and the human rights of Torres Strait Islanders', p. 249, http://www.humanrights.gov.au/social_justice/nt_report/ntreport08/pdf/casestudy1.pdf (accessed 8 January 2010).

5 TSRA, *Submission 18*, p. 26.

14.10 TSRA stated that on its behalf, the TSCMC in 2008 'facilitated research on coastal erosion', completed by the Queensland Environmental Protection Agency (EPA, now Department of Environment and Resource Management) and James Cook University (JCU). According to TSRA, this research highlighted the need for 'a suite of immediate works to mitigate coastal erosion and inundation hazards' and also identified critical knowledge gaps. In the view of TSRA, more detailed work is presently underway 'to assess and map inundation hazards to each community, involving updating of island datum's, high resolution terrain mapping and probabilistic hydrodynamic modelling'.⁶ According to Ms Morris, the researchers from JCU:

...were looking at what was happening: how frequently the inundations were occurring, what was happening to the sand, where it was going and why it was going there...They then looked specifically at eight islands that were in what they called the highest risk category...They looked not only at what was happening with sea level rise, erosion and accretion but also at potential mitigation components and opportunities for mitigation.⁷

14.11 In her view, scientists can provide very good advice on where and how things should be built and why some of the abatement processes are failing—the tyre walls, the rock walls and those sorts of things. She explained that they 'are working with the islands to give them information on the engineering and basic knowledge and predictive capacity around that'.⁸ Ms Morris continued:

There are many things that you can do. You can relook at your desalination plant. You can look at your sewerage plants. You can structure them differently. You can structure the housing differently. You can maintain some of the infrastructure.⁹

14.12 Ms Morris also referred to work being done on the way the communities respond to the changes and how fear is managed in the communities—'how they articulate that fear in relation to their heritage, what that means and how they think they are going to go'.¹⁰

14.13 The damage caused by sea water inundation in the Torres Strait has also been the subject of recent government studies. For example, the Australian Government through the Department of Climate Change released a number of studies on climate change that registered concerns already raised by Torres Strait Islanders. One report on the climate change risks to Australia's coast found:

Many communities are subject to significant coastal hazard issues with erosion and inundation directly threatening housing, infrastructure including roads, water supply systems, power stations, community

6 TSRA, *Submission 18*, pp. 26–27.

7 *Committee Hansard*, 25 March 2010, pp. 38–39.

8 *Committee Hansard*, 25 March 2010, p. 34

9 *Committee Hansard*, 25 March 2010, p. 39.

10 *Committee Hansard*, 25 March 2010, p. 34

facilities, cultural sites including cemeteries, traditional gardens and ecosystems.¹¹

14.14 The report noted that continuing inundation events for communities on the low-lying islands in the Torres Strait would 'require the development of short-term coastal protection and may require long-term relocation plans for approximately 2000 Torres Strait islander peoples'.¹² A scoping study, released in May 2010, noted that the 'majority of Saibai inhabitants wish to see the construction of a sea wall to protect the village'. It noted that this undertaking would be expensive and that, to date, funding had not been forthcoming, other than for basic repairs to the existing wall.¹³

Practical steps to address immediate problems

14.15 Regarding the lack of action in the construction of the sea wall, the TSRA informed the committee that it had submitted a proposal for funding the 2008 research recommendations to the Australian Government. The proposal was to implement coastal protection works for Saibai and Boigu, Iama and Poruma, Masig and Warraber and included seawall construction, bund building, sand re-location and elevation of essential infrastructure. According to the TSRA, the measures were intended 'to complement the house raising activities being implemented in some communities'.¹⁴ It explained:

The joint strategy of immediate works and comprehensive community based adaption planning is designed to alleviate current inundation and erosion issues whilst at the same [time] buying sufficient time to develop longer term adaption plans addressing sea level rise together with other potential climate change issues (including health, ecosystem, food, water border security etc). It is envisaged that the process of developing these plans will involve detailed consideration of adaptation options (such as seawalls, house raising, levees, filling, relocation, emergency planning) including social, cultural, economic, and environmental assessment over various time horizons.¹⁵

14.16 The TSRA estimated that the implementation of the proposed coastal works and the assessment of island adaptation needs would cost \$22 million. A

11 Commonwealth of Australia, *Climate Change Risks to Australia's Coast a First Pass National Assessment*, Department of Climate Change, 2009, p. 126.

12 Commonwealth of Australia, *Climate Change Risks to Australia's Coast a First Pass National Assessment*, Department of Climate Change, 2009, p. 127.

13 Green D, S Jackson and J Morrison, *Risks from Climate Change to Indigenous Communities in the Tropical North of Australia*, Department of Climate Change and Energy Efficiency, 2009, (released 5 May 2010), Canberra, p. 122.

14 *Submission 18*, p. 27.

15 *Submission 18*, p. 27.

comprehensive climate change adaptation strategy was being prepared by the LSMU at the TSRA.¹⁶

14.17 The committee sought information from representatives of the Queensland Government on its response to the problems caused by water inundation. Mr David Robinson informed the committee that while his Department of Environment and Resource Management provided advice and assistance to all councils in Queensland and the TSRA, the protection of property and related issues was primarily a matter for the local authorities. He said the department was working closely with TSRA which was undertaking a storm tides study. At the time, the study had not been completed but was expected 'to assist in the planning process'.¹⁷ He stated that the department did not have 'a funding program for that'.¹⁸ Mr Paul Toolis, Queensland Department of Infrastructure and Planning, explained:

...whilst it is fairly obvious there is an impact on climate change in the Torres Strait, there is quite a need for work to establish what that is, and that is the work that is going on at this time. The Department of Infrastructure and Planning has infrastructure programs going in the Torres Strait. At the moment, they are essentially targeted at environmental health infrastructure—that is, sewerage schemes, water supplies and waste management regimes. The Torres Strait Island Regional Council and the Torres Strait Regional Authority have certainly written to the Queensland government and advised them of this issue. At this stage, I understand that the process is to get a full understanding of what that really means. To my knowledge, at this stage there is no significant program to do remedial works.¹⁹

14.18 When asked about the immediate problems caused by the high tides that inundate these communities, Mr Toolis responded that he was unaware of any state government program that addressed such issues. He understood that there was an Australian government department assisting in this process and also that the TSRA had had consultations with a Commonwealth government agency.²⁰

14.19 Dr John Higgins, Commonwealth Department of Climate Change, informed the committee that he was aware of some concern on the Torres Strait Islands about the impacts of climate change. He explained that his department's role was 'in generating information that can be used to help make decisions about infrastructure'. He indicated that the construction of a sea wall would be 'handled within the portfolio

16 *Submission 18*, p. 27.

17 *Committee Hansard*, 25 March 2010, p. 30.

18 *Committee Hansard*, 25 March 2010, p. 30.

19 *Committee Hansard*, 25 March 2010, p. 30.

20 *Committee Hansard*, 25 March 2010, p. 31.

for Families, Housing, Community Services and Indigenous Affairs, who are responsible for those infrastructure projects in the Torres Strait'.²¹

Recommendation 23

14.20 The committee recommends that the Australian Government:

- **place a high priority on implementing practical measures that need to be taken in the short term to assist local communities in the Torres Strait better deal with and, where possible, mitigate the problems caused by higher sea levels and extreme weather events; and**
- **review the need for an education and training program designed specifically to assist those communities in the region most at risk from the damaging effects of changes in climate. The intention would be to determine how best to assist people to remain productive members of their community in a changing environment.**

Long-term issues

14.21 The TSRA's funding proposal also identified the need for a comprehensive climate change adaption program for the region, which would cover the ecology, economy, human health and social infrastructure of all the islands. The proposal detailed 'an approach to investigate, monitor and plan for adaptation to current coastal hazards as well as the potential effects of climate change'. It was intended that this program would 'build on the work by the EPA and JCU, incorporating strategies agreed to by the communities of Boigu, Saibai, Masig, Poruma, Warraber and Iama, but also address coastal management and climate change issues affecting other Torres Strait Island communities'.²²

Research on climate change

14.22 In 2009, the TSRA listed a number of studies then being undertaken in the Torres Strait, including:

- a rapid assessment shoreline erosion project, examining causes of coastal erosion in the Torres Strait—undertaken by the EPA;
- a sustainable land use planning project, educating communities on the impacts of development on the natural environment in the Torres Strait;
- a MTSRF project 'Climate change impacts in the Torres Strait: Building resilience and planning adaptation strategies', which aimed to integrate scientific and traditional knowledge for a regional workshop on adaptation; and

21 *Committee Hansard*, 18 June 2010, pp. 38–9.

22 TSRA, *Submission 18*, p. 27.

- a research project by JCU and University of Wollongong titled 'Understanding sea-level change in Torres Strait', which was to survey, sample and date material from reef flat corals to examine sea level changes over time.²³

14.23 The committee has also referred to the research that scientists with the CSIRO were undertaking on climate change in the Torres Strait, notably its effects on the life cycle and behaviour of mosquitoes.

14.24 Despite the number of research projects, considerable uncertainty still surrounds the issue of climate change and its consequences. Dr Butler, CSIRO, referred to the huge variations in the climate models and the enormous difficulties involved in trying to bring global-scale modelling down to a local scale. He informed the committee that the 'science of that is relatively young':

What we would say is that one way to tackle the uncertainty is to apply technical scenario planning where you look at all of the possible outcomes of future climate change plus the other things that go on anyway in terms of population growth and global economic forces and political processes and so on to try to tease out...what the future trajectories for the Torres Strait might be.²⁴

14.25 Dr Sheppard informed the committee that the research around the regionalisation of the climate, future climate mapping and modelling was about to start.²⁵ According to him, CSIRO would model the potential range of direct and indirect climate change impacts on the region's ecosystems, communities and economy. This undertaking would allow predictions of possible future scenarios for the Torres Strait's vulnerable communities and appropriate adaptation options. He could not provide a definite time for the completion of the early phase of this work. He noted that it 'really depends on how quickly we can have access to the regional climate modelling data' but surmised that it would be a five- to 10-year time frame.²⁶

14.26 Dr Sheppard noted that the research undertaken by CSIRO in the three separate areas of fisheries, biosecurity and climate change was located in quite different parts of the organisation. Scientists recognised, however, that the climate change components associated with each of them come together as being relevant. According to Dr Sheppard, CSIRO is looking to link the various areas of research that involves climate change. He stated further:

...research is most likely going to be coordinated through the CSIRO's Climate Adaptation National Research Flagship...The only aspect of the

23 House of Representatives Standing Committee on Climate Change, Environment and the Arts, *Managing our coastal zone in a changing climate*, 2009, paragraph 3.168, p. 108.

24 *Committee Hansard*, 18 December 2009, p. 41.

25 *Committee Hansard*, 18 December 2009, p. 34.

26 *Committee Hansard*, 18 December 2009, p. 38.

research that I highlighted that is not currently directly in the flagship is, I believe, the fisheries research.²⁷

14.27 For example, he informed the committee that the research into biosecurity associated with the risk from mosquitoes as vectors of human diseases was part of a much larger area of activity in the climate adaptation flagship. He explained:

The flagship funds these clusters that actually bring in collaboration with universities. It is part of a collaboration between CSIRO, the University of Queensland and the ANU around the general impacts of climate change on human health.²⁸

14.28 Dr Butler also spoke of the direction being taken by CSIRO in its research on climate change in the Torres Strait. He noted that a lot of the work was very focused, for example on bêche-de-mer, a species of bêche-de-mer or a species of mosquito. He explained that the research that CSIRO was trying to start in the Torres Strait was 'really about pulling all of those different strands together'. The intention would be to piece together 'a broader picture of what might happen and translate that or enunciate that in terms of human livelihoods, wellbeing and health and the economy as a whole up there'.²⁹

14.29 According to Dr Butler the research would include assessments of inundation, storm surges and the range of things that are thought likely to be a consequence of climate change. He stressed the importance of recognising that 'those are the sorts of short-term, tactical... "in your face"... effects of climate change'. He added:

But there are likely to be more indirect effects. For example, simply the price of fuel is going to be a major driver of how the economy of the region operates. That may be driven to some extent by climate change issues as well. So I think we would like to broaden up the question to the indirect issues as well as those very short-term direct problems that you have just mentioned.³⁰

14.30 Importantly, he noted that much of what happens to the Torres Strait may be influenced by what happens in PNG, particularly along the southern coast, 'whether those are climate impacts and the knock-on effects of them or broader political and economic issues'.³¹

14.31 Pressed on the question of a time frame for the study, Dr Butler also explained that 'ideally, in a perfect world, we would like to get it done within the next three, four or five years depending on availability of resources'. He added, however, that the

27 *Committee Hansard*, 18 December 2009, p. 34.

28 *Committee Hansard*, 18 December 2009, p. 38.

29 *Committee Hansard*, 18 December 2009, pp. 41–42.

30 *Committee Hansard*, 18 December 2009, p. 42.

31 *Committee Hansard*, 18 December 2009, p. 41.

long-term goal of turning that research 'into a sort of broader futures analysis of the Torres Strait will require, probably, some more resourcing'.³² According to Dr Butler, some of the funding was already allocated and some not.³³ He explained that funding for the MTSRF was coming up for renewal and 'if that all comes to fruition then hopefully those funds will be available, but if it does not then it is not quite so clear how this will go'.³⁴ The committee noted previously that the Australian Government has produced a new funding proposal but that details on future research were not available (see paragraphs 10.49–10.51).

Recent announcement

14.32 In May 2010, the then Minister for Climate Change announced \$400,000 for new research into the impacts of climate on Torres Strait communities and possible adaptation strategies. Dr Higgins explained:

The role of the Department of Climate Change and Energy Efficiency lies in generating a better information base for decision making. That information can then be taken into account in broader decisions about infrastructure needs, for example, and integrated with decisions about other things that infrastructure has to deal with.³⁵

14.33 The committee would hope that any future funding of research into climate change in the Torres Strait would come under, and feed into, the work being done by CSIRO's climate adaptation flagship.

Committee view

14.34 Numerous reports or assessments have been published in recent times that highlight the threat that changes in climate present for communities in the Torres Strait. They are united in drawing on current events and trends to conclude that the risks are serious and real although the extent is uncertain. This body of work exposes the lack of data on which to base firm predictions for the Torres Strait and underscores the need for more research. For example, even the recent scoping study on the risks from climate change to Indigenous communities in Northern Australia recommended an in-depth collaborative study.³⁶

14.35 While the committee recognises that more research is needed, it is concerned that currently there is no concerted, well-coordinated research plan that would focus predominantly on the Torres Strait. It notes that CSIRO has commenced work on

32 *Committee Hansard*, 18 December 2009, p. 42.

33 *Committee Hansard*, 18 December 2009, p. 42.

34 *Committee Hansard*, 18 December 2009, pp. 42–43.

35 *Committee Hansard*, 18 June 2010, p. 39.

36 Green D, S Jackson and J Morrison, *Risks from Climate Change to Indigenous Communities in the Tropical North of Australia*, Department of Climate Change and Energy Efficiency, 2009, (released 5 May 2010), Canberra, pp.143–144.

'detailed modelling to downscale a range of regional climate change projections and predict direct impacts and changes on marine ecosystems, island infrastructure and communities' in the Torres Strait.³⁷ It notes further the reference made by CSIRO researchers to its 'climate adaptation flagship'. The committee believes that this project, which intends to draw together all facets of research that touch on climate change in the Torres Strait, is well over due. It welcomes this initiative and fully supports CSIRO's 'climate adaptation flagship' but notes the uncertainty surrounding its long-term funding.

Recommendation 24

14.36 The committee recommends that the Australian Government lend its full support to CSIRO's 'climate adaptation flagship' and ensure that adequate funding is made available to the institution to continue this initiative.

Recommendation 25

14.37 In conjunction and closely connected with this initiative, the committee recommends that the Australian Government fund a study into socio-economic developments in the region, including in the South Fly District, and their implications for water and food security and populations movements in the area.

14.38 Consistent with recommendations in chapter 9, the committee would expect that consultation with the local communities about the flagship and the close involvement of local people in all aspects of associated research projects would be required.

14.39 The committee again notes that the Torres Strait region is a shared jurisdiction and, furthermore, that the effects of climate change on the PNG side of the border cannot be treated as distinct and separate from developments on the Australian side. The committee believes that the collaborative approach being taken by CSIRO should also encompass research on the PNG side.

Recommendation 26

14.40 The committee recommends that the Australian Government assist PNG to undertake complementary studies of climate change in Western Province by providing funding for research, opening up research opportunities for PNG researchers to work alongside Australian researchers in this area and for Australian researchers to work in PNG. For example, the Australian Government should consider offering scholarships or traineeships for PNG students to participate in CSIRO's climate adaptation flagship.

Recommendation 27

14.41 The committee recommends that ACIAR consider including climate change and the implications for coastal villages in PNG's southern region in its

37 *Committee Hansard*, 18 December 2009, pp. 33–34.

research priorities for PNG (traditional fishing, the conservation of species, including the dugong and turtle, and emergence and/or spread of exotic pests).

14.42 Before concluding this chapter, the committee wishes to refer to evidence received regarding climate change in the Torres Strait and the Environmental Management Committee (EMC) and the Joint Advisory Council (JAC).

14.43 In December 2009, DEWHA informed the committee that there had been minor discussion on climate change issues at the recent EMC meeting at the start of November. The department indicated that the issue had also been brought to EMC's notice earlier in the year by the traditional inhabitants. According to the department, the EMC determined that it was not the right forum for the resolution of those issues, given that climate change departments were not represented on the committee. Under the Treaty, the matter was referred to the JAC, which determined that it also was not the correct forum to address issues directly. It did, however, undertake to have climate change staff from both Australian and PNG government departments address the committee the following year and discuss the issues and share information with the traditional inhabitants.³⁸

Committee view

14.44 Given the importance that local inhabitants attach to the effects of climate change in their communities, the committee was surprised to learn that this matter was not a key item for discussion at the EMC and the JAC. The committee believes that the effects of climate change should be a matter that both committees consider, especially in light of the concerns of local leaders.

Recommendation 28

14.45 The committee recommends that the Australian Minister for Foreign Affairs consult with his PNG counterpart about removing immediately any possible impediment to the Environment Management Committee and the JAC considering climate change in the Torres Strait.

38 *Committee Hansard*, 17 December 2009, p. 70.

Part IV

Consultation and cooperation in the region

The Torres Strait Treaty not only creates an international border between Australia and PNG but is also instrumental in protecting the traditional way of life of local inhabitants. It provides the framework within which the Australian, PNG, state and provincial governments together with the local people work as partners to protect and preserve the Torres Strait environment and the livelihood of traditional inhabitants. In agreeing to the Treaty, Australia and PNG also recognised the value of commercial fishing in the region and the importance of promoting the 'conservation, management and optimum utilisation of Protected Zone commercial fisheries'.

The effectiveness of the Treaty rests on the support, good will and cooperation of all involved in its implementation. It relies, therefore, on a high level of collaboration between the various levels of government. The final part of this report examines the complex relationships between federal, state and international government agencies. It recognises the importance of local support for the Treaty and the arrangements for implementing its provisions and managing community expectations