

6. POLICY AND LEGISLATIVE FRAMEWORK FOR CLIMATE CHANGE ADAPTATION IN SEQ

Current arrangements related to climate change adaptation policies and legislation in SEQ involve the three tiers of government as well as initiatives from the private sector (see Figure 4). The success of these arrangements will depend on how well sectoral and cross sectoral responses can be coordinated vertically (between national, state and local initiatives) and horizontally (across sectors within a government level).

In addition, such arrangements will need to pursue a better engagement of the private sector and broader community in order to legitimise climate change adaptation options that will be developed as part of the human settlements component. This section briefly outlines existing policies, programmes, plans and strategies as well as legislation currently in place at the national, state and local levels.

6.1 National Climate Change Adaptation Initiatives

General Initiatives

6.1.1 National Climate Change Adaptation Program

The National Climate Change Adaptation Program aims to start preparing governments, vulnerable industries and communities for the unavoidable impacts of climate change. Key objectives of the four-year programme are to advise governments on policy issues related to climate change impacts and adaptation, including key risks to and opportunities for Australia from climate change. The programme seeks to build capacity to support the development of effective and targeted adaptation strategies as well as to engage stakeholders and provide targeted and scale-relevant information and tools to industry sectors and regions. In addition, it aims to integrate climate change impacts and adaptation considerations into key policies and programmes, including risk management practices across vulnerable sectors (Department of Climate Change 2009c).

6.1.2 Local Adaptation Pathways Program (LAPP)

Through the Department of Climate Change, the Australian Government created the Local Adaptation Pathways Program (LAPP) aiming to provide funding to help local authorities undertake climate change risk assessments and develop action plans to prepare for the likely local impacts of climate change. The government has allocated \$1.5million to fund 33 projects as part of Round 1, in which several local authorities from SEQ were recipients (Department of Climate Change 2009b).

6.1.3 National Climate Change Adaptation Framework

In 2006, the Council of Australian Governments (COAG) requested the development of a National Adaptation Framework as part of its *Plan of Collaborative Action on Climate Change*. The Framework outlines the future agenda of collaboration between governments to address key demands from business and the community for targeted information on climate change impacts, and to fill critical knowledge gaps which currently inhibit effective adaptation. A key focus of the Framework is to support decision-makers to understand and incorporate climate change into policy and operational decisions at all scales and across vulnerable sectors (COAG n.d.: 3).

This framework has two priority areas for potential action: building understanding and adaptive capacity; and reducing vulnerability in key sectors and regions, including water resources, biodiversity, coastal regions, agriculture, fisheries, forestry, health, tourism and settlements.

Urban planning and management, including coastal management, and human health are nominated as priority sectors. In terms of settlements, infrastructure and planning, the Framework supports the development of research to better understand climate impacts on human settlements.

The Framework also encourages the review of both planning and infrastructure systems in

Figure 4. Overview of policy and legislative framework for climate change adaptation in SEQ.

NATIONAL - General Initiatives	STATE - General	REGIONAL - SEQ	LOCAL
<ul style="list-style-type: none"> National Climate Change Adaptation Program (DCC) Local Adaptation Pathways Program (DCC) 	<ul style="list-style-type: none"> ClimateQ: toward a greener Queensland 2009 (QCCCE) Climate Smart Adaptation 2007-2012 (QCCCE) 	<ul style="list-style-type: none"> SEQ Regional Plan 2009-2031 	<ul style="list-style-type: none"> SUNSHINE COAST REGIONAL COUNCIL <ul style="list-style-type: none"> Climate Change Risk Assessment and Action Plan Draft Climate Change Strategy 2009-2020
<ul style="list-style-type: none"> National Climate Change Adaptation Framework (COAG) 	<ul style="list-style-type: none"> Sustainable Planning Act 2009 (SPA 2009) 	<ul style="list-style-type: none"> Draft SEQ Climate Change Management Plan 	<ul style="list-style-type: none"> BRISBANE CITY COUNCIL <ul style="list-style-type: none"> Brisbane City Plan for Action on Climate Change and Energy BCC Budget for 2009-2010 WaterSmart City Strategy
NATIONAL - Sectoral Initiatives	<ul style="list-style-type: none"> Queensland Coastal Protection and Management Act 1995 	<ul style="list-style-type: none"> SEQ Natural Resource Management Plan 2009-2031 	<ul style="list-style-type: none"> IPSWICH CITY COUNCIL <ul style="list-style-type: none"> Ipswich Corporate Plan 2007-2012 Climate Change Risk Assessment (incl. Lockyer Valley Regional Council, Somerset Regional Council and Toowoomba Regional Council)
Emergency Management initiatives	<ul style="list-style-type: none"> Draft Queensland Coastal Plan Disaster Management Act 2003 		<ul style="list-style-type: none"> GOLD COAST CITY COUNCIL <ul style="list-style-type: none"> GCCC Corporate Plan 2009-2014 Gold Coast City Climate Change Strategy 2009
<ul style="list-style-type: none"> Natural Disaster Relief and Recovery Arrangements (NDRRA) Natural Disaster Resilience Program (NDRP) - Bushfire Mitigation Program; Natural Disaster Mitigation Program (Regional Flood Mitigation Program); National Emergency Volunteer Support Fund National Partnership Agreement on Natural Disaster Resilience National Risk Assessment Framework - National Risk Assessment Advisory Group; Technical Risk Assessment Advisory Committee 	STATE - Sector Specific		<ul style="list-style-type: none"> MORETON BAY REGIONAL COUNCIL <ul style="list-style-type: none"> MBRC Corporate Plan 2009-2014 Caboolture Shire Plan Caboolture Shire Natural Disaster Risk Management Study Scoping Study on Climate Change Risks
Human Health initiatives	<ul style="list-style-type: none"> Queensland Health Population Health Plan (2007-2012) Strategic Directions for Environmental Health (2009-2012) Queensland Health Disaster Management Program 		<ul style="list-style-type: none"> LOGAN CITY COUNCIL <ul style="list-style-type: none"> Logan-Scenic Rim Climate Adaptation Project SCENIC RIM REGIONAL COUNCIL <ul style="list-style-type: none"> Boonah Shires Futures
<ul style="list-style-type: none"> Public Health Information Line (PHIL) National Health Disaster Management Capability Audit The Emergency Triage Education Kit (ETEK) 			<ul style="list-style-type: none"> REDLAND CITY COUNCIL <ul style="list-style-type: none"> Redland Shire Council Corporate Plan 2006-2010 Risk Management Process and Climate Adaptation Plan

order to increase human settlements resilience to climate change.

An important early output in respect of coastal management was the release of a “first pass” national assessment of Australian coastal vulnerability in 2009 (Department of Climate Change 2009a). The assessment highlights the scale of climate change-related problems faced by Australia as well as associated key risks. It also highlights the role adaptation plays in managing such risks (Department of Climate Change 2009a).

Priorities in the health sector include the development and implementation of a national action plan to address climate change and health, development of warning and response systems, and improved research on climate change and health.

Sector-specific initiatives

This section identifies initiatives that contribute to the development and implementation of climate change adaptation options for specific sectors. A number of these initiatives reflect current institutional arrangements which are characterised by an organisational structure that goes beyond a single government department or the government sector itself. Of particular interest here are the current arrangements in place in the area of emergency management as they involve a complex set of government institutions and independent organisations.

In the health sector, the Commonwealth Department of Health and Ageing maintains several arrangements and initiatives to deal with environmental health issues. These are typically stand-alone initiatives that are linked to other government-wide initiatives where appropriate. By contrast, key initiatives in the urban planning and management sector occur at the state or regional level, rather than at the national level, although there is growing support for a nationally coordinated approach to planning principles for adaptation.

6.1.4 Emergency management arrangements

Natural Disaster Relief and Recovery Arrangements (NDRRA)

Under the Natural Disaster Relief and Recovery Arrangements (NDRRA), funding assistance is available to States to alleviate the financial burden associated with the provision of natural disaster relief payments and infrastructure restoration. It is triggered after a natural disaster has occurred, following a request by the State Premier. The arrangements in Queensland are discussed below.

The Natural Disaster Resilience Program (NDRP)

The Natural Disaster Resilience Program (NDRP) is a new programme which consolidates the existing Bushfire Mitigation Program (BMP), Natural Disaster Mitigation Program (NDMP) and, from 2010-2011, the National Emergency Volunteer Support Fund (NEVSF). The Bushfire Mitigation Program was a national programme aimed at identifying and addressing bushfire mitigation risk priorities across Australia. It ceased on 30 June 2009 and was incorporated into the Natural Disaster Resilience Program.

The Natural Disaster Mitigation Program was a national programme, which aimed to identify and address natural disaster risk priorities across Australia. This programme funded natural disaster mitigation works, measures and related activities that contribute towards improving communities’ ability to withstand the effects of disasters. In general, the Australian Government will contribute up to one third of the project costs. The states and territories are required to match this funding but can contribute more, while local agencies and in some cases private sector contributors cover the remaining costs.

The Regional Flood Mitigation Program was incorporated into the NDMP in 2007. This programme had previously funded flood mitigation works and measures to reduce the cost of flooding in rural, regional and outer metropolitan areas.

There is no specific mention of climate change in the NDMP but there is a recognition that “scientific research indicates that more extreme weather events, and large-scale single events with more severe cyclones, storms and floods, are expected in the future” (EMA 2004).

The National Emergency Volunteer Support Fund focuses on emergency management volunteers and recognizes the needs and significant front-line role that volunteers play in reducing vulnerability and enhancing community safety (EMA, 2009a). The NEVSF will cease on 30 June 2010 and funding for new projects supporting emergency management volunteers will be available under the NDRP.

A key aim of the NDRP is to “enhance Australia’s resilience to natural disasters through mitigation works, measures and related activities that contribute to safer, sustainable communities better able to withstand the effects of disasters, particularly those arising from the impact of climate change” (EMA 2010). This programme will be administered as a partnership with states and territories. The NDRP will be administered through the National Partnership Agreement on Natural Disaster Resilience.

National Partnership Agreement on Natural Disaster Resilience

This Partnership Agreement provides for “collaboration on natural disaster mitigation activities to strengthen communities’ resilience to, and minimise the impact of, a range of natural disasters in Australia” (COAG 2009, p. 1). The focus of the agreement is on building resilience to withstand natural disasters, although consideration may also be given to other emergency management priorities identified in state or territory risk assessments. The expected outcomes from this partnership are a reduction in risk from the impact of disasters, appropriate emergency management capacity and support for volunteers.

National Risk Assessment Framework

The National Risk Assessment Framework was developed in response to COAG’s 2002 report

on Natural Disasters in Australia and the commitment to “develop and implement a 5-year national programme of systematic and rigorous disaster risk assessments”. The Framework was designed to improve collective knowledge about natural hazard risk in Australia (Geoscience Australia 2007). It focuses on risk assessment for natural hazards (bushfires, earthquakes, floods, storms, tropical cyclones, storm surges, landslides, tsunamis, tornados and meteorite strikes), not on risk management or mitigation.

Current priorities under this framework include preparing risk assessment guidelines for Australian, state and territories and local governments to undertake risk assessments in a consistent and rigorous way, reaching a first-pass understanding of existing gaps in knowledge and developing strategies to prioritise and address these gaps to increase the understanding of natural hazard risk in Australia.

Two committees were formed to implement the framework (Geoscience Australia 2007). The National Risk Assessment Advisory Group (NRAAG) oversees the implementation of the framework and production of a new information base on risk, and reports to AEMC. The Technical Risk Assessment Advisory Committee (TRAAC) provides technical support to NRAAG for the implementation of the framework, expert hazard-specific advice on addressing gaps in knowledge and method development, and advice on employing new information on risk to assist mitigation through land use planning, insurance and building codes.

6.1.5 Human Health arrangements and initiatives

Public Health Information Line

The Public Health Information Line (PHIL) was established in response to the SARS outbreak in 2004. Since that time its role has evolved, and it now provides a point of contact for questions and information for the public on relevant emerging threats and issues.

National Health Disaster Management Capability Audit

The National Health Disaster Management Capability Audit 2005 is the second in a series of national capability audits undertaken by the Australian Health Protection Committee (AHPC), previously the Australian Health Disaster Management Policy Committee (AHDMP), to provide a national assessment of health assets that may be employed in a health disaster. The first National Health Disaster Management Capability Audit was carried out in 2003 (2003 Audit). In 2005 the AHDMP agreed it was timely to undertake the second audit. The rationale behind the 2005 Audit was to provide a more current and detailed “snapshot” of Australia’s public health disaster response assets over the audit window of August to November of 2005.

The Emergency Triage Education Kit

The Emergency Triage Education Kit (ETEK) provides a nationally consistent approach to the education of emergency clinicians for the triage role, and promotes the consistent application of the Australasian Triage Scale (ATS). The ETEK is the product of collaboration between the Australian Department of Health and Ageing and other stakeholders including:

- The Australasian College of Emergency Medicine (ACEM);
- The College of Emergency Nursing Australasia (CENA);
- The Australian College of Emergency Nursing (ACEN); and
- The Council of Remote Area Nurses Australia (CRANA).

Representatives of these groups formed the National Triage Working Party (NTWP) and were responsible for assisting the Department of Health and Ageing with the development and implementation of the ETEK.

6.2 State Initiatives

6.2.1 Climate change adaptation policies

There are two climate policies that are most relevant to the development and implementation of climate change adaptation options in SEQ:

- *ClimateQ: toward a greener Queensland 2009* (Department of Environment and Resource Management 2009a); and
- *ClimateSmart Adaptation 2007-2012* (Department of Natural Resources and Water 2007).

ClimateQ: toward a greener Queensland 2009 consolidates and updates the approaches taken in *ClimateSmart 2005* (Queensland Government 2007) and *ClimateSmart Adaptation 2007-2012* and outlines key investments and policies of Queensland’s climate change response. While many of the investments and policies contribute to mitigation, *ClimateQ* also strengthens the focus on adaptation to climate change impacts, through two of the five key themes for action: protecting significant ecosystems through conservation and improving resilience, and adapting to the impacts of climate change.

Policy initiatives are grouped into sectors including energy, business, planning and building, community, primary industries, transport, ecosystems and government. A new focus is on preparation for natural disasters which are likely to increase in frequency and severity with climate change, including the establishment of disaster management warehouses, capacity building in vulnerable communities and bushfire education campaigns.

ClimateSmart Adaptation 2007-12 is a 5-year plan to provide the foundation for building Queensland’s resilience to the impacts of climate change, and is implemented and coordinated by the Queensland Climate Change Centre for Excellence (QCCCE). It identifies a range of ways in which government and industry can include climate change considerations into their decision-making within the priority sectors of: water planning and services, agriculture, human settlement, natural environment and landscape, emergency services and human health, tourism, business and industry, and finance and insurance. The plan seeks to enhance understanding of climate change risks and vulnerabilities; consideration of climate change impacts in decision-making;

and practical steps to enhance resilience to climate change (Department of Natural Resources and Water 2007).

The Plan's four guiding principles are that:

- Adaptation actions contribute to sustainability;
- Adaptation actions do not replace efforts to reduce GHG emissions;
- Actions consider the emissions they may generate; and
- Working in partnerships is fundamental to success.

6.2.2 Legislative Instruments

Sustainable Planning Act 2009

The *Sustainable Planning Act 2009* (SPA 09) commenced in January 2010, replacing the *Integrated Planning Act 1997* (IPA 97). The SPA 09 makes explicit reference to climate change in its objectives. A key purpose of SPA 09 is “managing the effects of development on the environment, including managing the use of premises.” (SPA, s3b), and advancing this purpose includes ensuring decision-making processes “take account of short and long term environmental effects of development ... including, the effects of development on climate change.” (SPA, s5 (1)(a)(ii)). This provision, however, does not make reference to the need to consider the effect of the environment/climate change on development applications.

SPA also makes provision for the establishment of regional planning committees by the Minister (SPA, s31.30). These committees could potentially be used to address climate change issues affecting SEQ. No fixed geographical area limits the establishment of such committees, which could be set across multiple local government areas.

Under the SPA, local authorities must review their planning schemes every 10 years (SPA, s 91). This also represents an opportunity for local authorities to include or review climate change adaptation options specific to their contexts.

Queensland Coastal Protection and Management Act 1995

The *Coastal Protection and Management Act 1995* (Coastal Act 2009) consolidated Queensland's fragmented regulatory regime for coastal issues, replacing the *Canals Act 1958*, *Beach Protection Act 1968*, and *Harbour Act 1955*. The Coastal Act provides for the protection and management of the coast and its resources, including its uses. It also promotes the integration of other legislation to ensure the sustainable development of the coastal zone as well as reinforcing the knowledge about coastal resources and how human activities affect them.

Draft Queensland Coastal Plan 2009

The *Draft Queensland Coastal Plan 2009* (Department of Environment and Resource Management 2009b) will replace the current *State Coastal Management Plan—Queensland Coastal Policy 2001*. It recognises that low-lying coastal communities are particularly vulnerable to the effects of climate change, facing hazards, such as coastal erosion, storm tide inundation and permanent inundation due to sea level rise, and includes a policy to reflect on potential climate change impacts in decision-making on the use and management of coastal resources. Part of the Draft Plan is a *Draft State Planning Policy Coastal Protection* (Department of Environment and Resource Management 2009b) which will become a statutory instrument under the *Sustainable Planning Act 2009* (SPA 09).

The *Draft State Planning Policy Coastal Protection* aims to protect coastal resources through criteria for land-use planning and development assessment, including prohibiting permanent development in coastal hazard areas. It also accounts for the design and location of development to avoid and reduce coastal hazard risks, given the impacts of climate change. The coastal hazard area is defined by reference to projected sea level rise of 0.8m by 2100. Planning should be based on this projection, with additional allowances of 1.5 metres for storm tide effects. Planning should also consider a 10 percent increase in cyclone intensity and a

100-year average return interval for extreme storm events.

It requires local planning schemes to identify coastal zone, coastal management district, coastal building lines, and storm tide inundation areas. Development will need to be located outside high risk areas, with no future urban areas allocated within coastal hazard areas. New development within existing areas must not increase risks. Detailed requirements for compliance with these broad goals are set out in Annex3 of the of *Draft State Planning Policy Coastal Protection*.

Disaster Management Act 2003

The *Disaster Management Act 2003* (DMA 2003) forms the legislative basis for disaster management activities within all levels of government in Queensland and the Queensland Disaster Management System. It adopts a comprehensive approach to disaster management, encompassing disaster mitigation, prevention, preparedness, response and recovery. The main objectives of the DMA are (DMA 2003, p. 12):

- To help communities mitigate the potential adverse effects of an event, prepare for managing the effects of an event, and effectively respond to, and recover from, a disaster or an emergency situation;
- To provide for effective disaster management for the State; and
- To establish a framework for the management of the State Emergency Service (SES) and emergency service units to ensure the effective performance of their functions.

The DMA requires the establishment of disaster management groups for the State, disaster district and local levels (for individual or combined local governments and community councils) and preparation of disaster management plans at all three levels. These tiered disaster management arrangements should enable a progressive escalation of support and assistance through each tier, as required. Within these arrangements, the local governments are the focus for managing disasters within their own communities, while the role of the state and

district levels is to provide additional resources, support, assistance and expertise as and when required.

The DMA has maintained the membership of the SES and has enabled the establishment of volunteer emergency service units to perform rural fire and SES functions, and first aid in rural and remote areas, through one integrated unit. These units should provide a more efficient option for the delivery of volunteer emergency services.

6.2.3 Emergency Management Policies and Plans

State Disaster Management Plan

The *State Disaster Management Plan* sets out Queensland's approach to disaster management in accordance with the legislative responsibilities of the DMA to ensure that the groups established under this Act provide for effective disaster management for the State (State Disaster Management Group 2008). Its purpose is to ensure a common understanding of State disaster planning arrangements, outline concepts, roles, responsibilities, processes and finances to stakeholders and agencies at each level of the arrangements, and provide the basis for the development of planning guidelines for Local and District Disaster Management Group plans.

There is no mention of climate change in this plan, but there is a recognition that "human activities are changing the delicate balance of nature and the earth, interfering as never before with the atmosphere, the oceans, the polar ice caps, the forest cover and the natural pillars that make our world a liveable place" (State Disaster Management Group 2008, p. 12).

2008 State Community Recovery Plan

The State Community Recovery Plan was developed by the State Community Recover Committee, which is chaired by the Department of Communities. The Plan defines disaster recovery as "the coordinated process of supporting affected communities in the reconstruction of physical infrastructure and the restoration of emotional, social, economic

and physical wellbeing” (Department of Communities 2008, p. 2). Disaster recovery includes the following four inter-dependent elements: community recovery, coordinated by the Department of Communities; infrastructure recovery, coordinated by a number of agencies; environmental recovery, coordinated by the DERM; and economic recovery, coordinated by the Department of Tourism, Regional Development and Industry in close association with the Department of Primary Industries and Fisheries.

The State Community Recovery Plan recognises that effective community recovery requires integration of and coordination across the four elements of disaster recovery. In addition, it recognises that a cooperative, multi-agency approach to supporting individuals and communities is essential for effective community recovery following a disaster. However, in the absence of an agreed coordination mechanism, the State Community Recovery Plan only details the agreed roles and responsibilities of the different agencies involved in the six phases of community recovery: preparedness, alert/stand-by, activation, immediate to short-term recovery, medium to long-term recovery, and stand-down/de-brief (Department of Communities 2008). In addition, the Plan outlines the membership and key functions of the State Community Recovery Committee.

Community Recovery Plans are also supposed to be developed at the Disaster District and Local levels.

In addition to the disaster management acts and plans described above, the Queensland Government has developed further emergency and disaster management initiatives and arrangements.

The Disaster Management Strategic Policy Framework (2005)

The Disaster Management Strategic Policy Framework is Queensland’s key strategic tool for disaster management. The Framework adopts the comprehensive, all hazards, all agencies approach to disaster management, as recommended in COAG’s 2002 report ‘Natural Disasters in Australia: Reforming

mitigation, relief and recovery arrangements’.

The Framework establishes the vision for disaster management and sets the direction for delivery of enhanced community safety and sustainability outcomes. The aims of the Framework are to articulate the vision and goals for disaster management for the State in line with objectives of the DMA 2003, outline strategic direction to guide the development of disaster management policies and programmes for Queensland, align Queensland’s strategic direction for disaster risk reduction with international and national reforms, and mainstream disaster mitigation into relevant areas of activity of government, NGOs, small businesses and corporations (State Disaster Management Group 2005).

The Framework has identified elements that represent best practice disaster management and outline how the comprehensive, all hazards, all agencies approach will be applied in Queensland. These elements are: disaster research, policy and governance, disaster risk assessment, disaster mitigation, disaster preparedness, disaster response, disaster relief and recovery, and post-disaster assessment.

Climate change is not mentioned in this Framework. However, the continuous improvement approach applied to this Framework and the inclusion of ‘Disaster Research’ as one of the elements of the Framework may allow for the integration of climate change considerations in future iterations.

Natural Disaster Resilience Program – Queensland

The Natural Disaster Resilience Program is a 4-year grant programme for disaster mitigation and community resilience. The NDRP’s vision is “to reduce Queensland communities’ vulnerability to natural hazards by supporting regional councils and other stakeholders to build community resilience” (Department of Community Safety 2010). This vision is supported by the following four objectives:

- Reduce community vulnerability to natural hazards;
- Support local governments and others to

build community resilience and increase self-reliance;

- Promote innovation through a focus on building partnerships between sectors, support volunteering, encourage a regional or catchment area approach to mitigation, and potential impacts due to climate change; and
- Ensure that NDRP funding is utilised in an efficient way.

The priorities of the NDRP are to target funding to Queensland's highest natural hazard risks, enhance community preparedness for natural event through community education and awareness raising, and increase resilience across sectors.

Queensland's Natural Disaster Relief Arrangements

Queensland's Natural Disaster Relief and Recovery Arrangements (NDRRA) is a joint State and Australian Government funding mechanism to provide financial assistance to local councils and communities following disaster events. It is administered by the Department of Infrastructure and Planning and is the primary financial mechanism used by the Queensland Government to provide assistance following disasters. Funding under these arrangements is unlimited (State Disaster Management Group 2006).

The objective of these arrangements is "to assist the recovery of communities whose social, financial and economic well-being has been severely affected by a natural disaster event" (State Disaster Management Group 2006). Funding can be provided to communities which do not have sufficient resources to recover from the disaster and to local government agencies to help them restore public infrastructure.

Eligible natural disasters under these arrangements include: cyclone, flood, storm, bushfire, storm surge, tsunami, tornado and earthquake. Drought, however, is not considered an eligible disaster event. In addition, small natural disasters (i.e. where costs of all assistance measures do not exceed \$240,000) are not eligible for Commonwealth

funding under NDRRA (State Disaster Management Group 2006).

The following Natural Disaster Relief Measures can be made available to help individuals and communities affected by disasters (State Disaster Management Group 2006):

- Counter Disaster Operations (to alleviate personal hardship): administered by the Department of Community Safety; to assist community response/recovery and ensure safety of life, health and property.
- Disaster Relief Assistance Scheme (to alleviate personal hardship): emergency assistance of up to \$150 per person (or \$700 per family) provided for the purchase of food, clothing, accommodation and medical supplies immediately following a disaster; administered by the Department of Communities.
- Associations Relief Assistance Scheme: concessional loans and accompanying grants (to non-profit organisations unable to provide for their own recovery) to restore assets to pre-disaster standards; administered by the Department of Communities.
- Restoration of public assets: grants to local governments and government departments to restore essential public assets to their pre-disaster standard; assistance to local governments is administered by the Department of Local Government, Planning, Sport and Recreation, while assistance to government departments is administered by the Department of Community Safety.
- Concessional loans to primary producers: concessional loans for carry-on needs, stock replacement and restoration of fixed/landed assets; administered by Queensland Rural Adjustment Authority (QRAA).
- Freight subsidies to primary producers: concessions of up to 50% may be approved for the movement of essential items including food, building materials, stock, fodder, water, machinery or fuels; administered by the Department of Primary Industries and Fisheries.

- Concessional loans to small businesses: to help small businesses re-establish operations following physical loss; administered by QRAA.

6.2.4 Human Health Policies and Plans

Queensland Health Population Health Plan (2007-2012)

Under the Queensland Health Population Health Plan (2007-2012) the potential impact of climate change is noted as a key challenge facing the health sector and community.

Strategic Directions for Environmental Health (2009-2012)

The Strategic Directions for Environmental Health document establishes the full body of work and initiatives that population health staff will focus on. Key points include:

- Queensland Health will implement strategies to enhance its ability to provide comprehensive environmental health risk assessment advice. These include strengthening Queensland Health's capacity and ability to provide timely health risk assessment advice, managing significant health risk assessments and formalising partnership agreements with key agencies.
- Queensland Health will also work to secure a dedicated workforce to help create supportive physical and social environments through key land use and other planning processes.
- Provide health risk assessment advice in the development of climate change adaptation and mitigation strategies including research activities.

Queensland Health Disaster Management Program

Under its Disaster Management Program Queensland Health provides an information service for the community and professionals with a range of disaster management 'fact sheets'. These fact sheets provide information on the possible health implications of a natural disaster and coping mechanisms and action plans. An adjunct to these fact sheets is the '13 Health' phone service which can provide qualified non-urgent health advice.

6.3 Regional Initiatives

SEQ has experienced unprecedented growth in the past four decades and continues to be the fastest growing metropolitan region in Australia. This forced the State Government to move from the previous voluntary collaborative approach to regional planning, which had existed since the early 1990s, to a statutory plan that was binding on the private sector, all agencies of state government and all local authorities in the region. The State's (and local governments') first foray into statutory regional planning came with the 2005 *SEQ Regional Plan 2005-2026* – a growth management strategy.

The Regional Plan is both a statutory instrument and a planning instrument. It is the "pre-eminent plan for the SEQ region and takes precedence over all other planning instruments" (Office of Urban Management 2005, p. 2). As the superior plan, all other plans, policies and codes of state agencies and local government in SEQ have to reflect and align with it. The manner in which the Regional Plan guides and directs all statutory and non-statutory planning initiatives in the region (both state and local government level as well as the non government sector) is illustrated in Figure 5.

A significant regional planning initiative has been the introduction of an annual Infrastructure Plan for the region to accompany the Regional Plan. This plan outlines the State Government's infrastructure priorities that are required to support the Regional Plan. A further significant initiative has been the triple bottom line approach that has been adopted in the provision of infrastructure through the recognition of "environmental infrastructure" in addition to the traditional forms of "physical" and "social (community)" infrastructure. The Infrastructure Plan defined "environmental infrastructure" to include: public open space, national, state and regional parks and opportunities for nature-based recreation (Office of Urban Management 2005, p. 4).

SEQ Regional Plan 2009-2031

The Regional Plan sets out a performance-based planning system for SEQ. Its policy intentions are guided and directed by a series of twelve Desired Regional Outcomes (DROs): sustainability (including climate change); natural environment; regional landscape; natural resources; rural futures; strong communities; engaging Aboriginal and Torres Strait Islander peoples; urban development; economic development; infrastructure; waste management; and integrated transport.

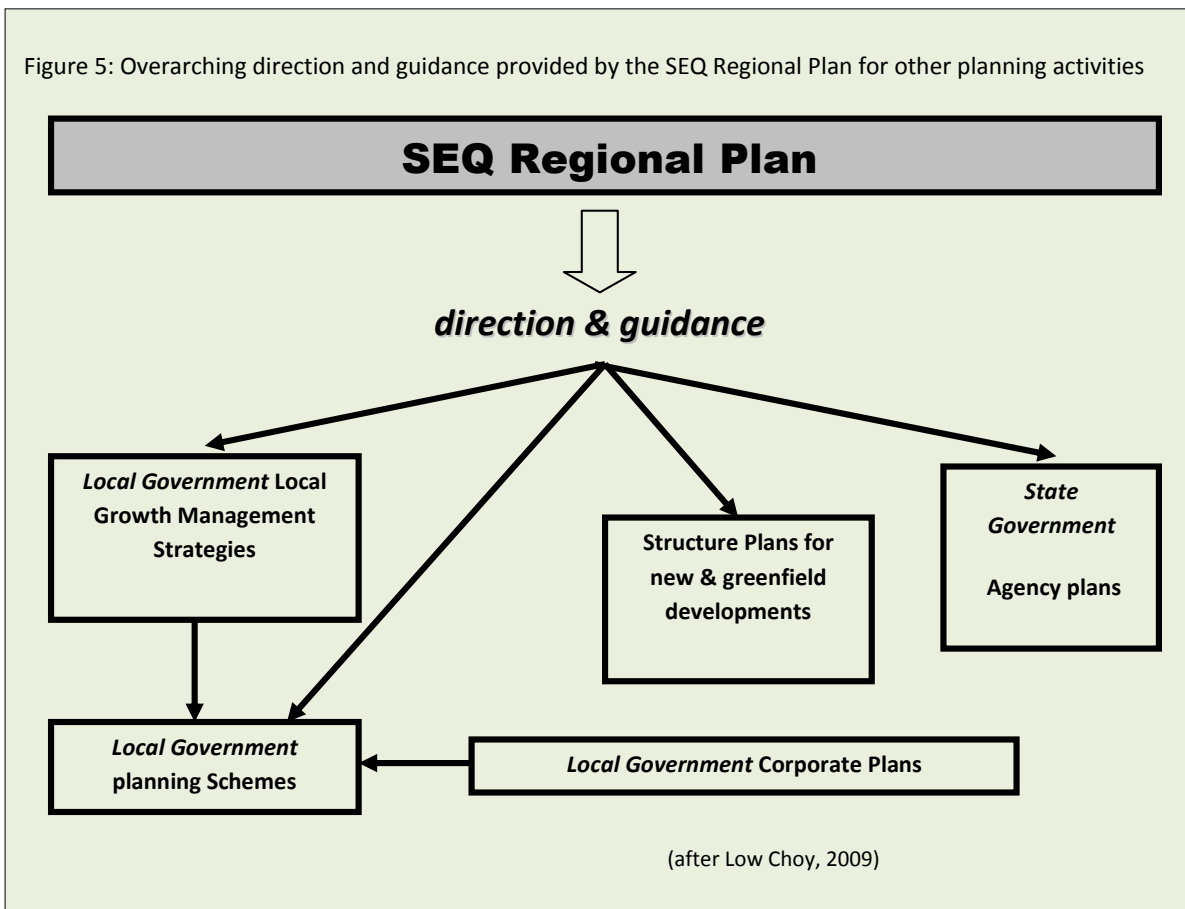
The current *SEQ Regional Plan 2009-2031* was released in July 2009. For the first time it has put climate change adaptation into the regional planning agenda. Its stated overriding intent is to “ensure the region grows and changes in a sustainable way” (Department of Infrastructure and Planning 2009a, p. 39) and that must include planning for the impacts of climate change on the region. One of the eleven strategic directions in the plan is “addressing climate change and oil supply vulnerability,” acknowledging the vulnerability

of the region to climate change and the need for both mitigation through the reduction of emissions and the development of adaptation strategies including protecting at-risk areas. This strategic direction is formalised into the first DRO concerning sustainability and climate change:

“The region grows and changes in a sustainable manner – generating prosperity, maintaining and enhancing quality of life, minimising the use of resources, providing high levels of environmental protection, reducing greenhouse gas emissions and becoming resilient to natural hazards including the projected effects of climate change and oil supply vulnerability” (Department of Infrastructure and Planning 2009a, p. 39)

There are five principles, with supporting policies and programs, developed to achieve this DRO. The third principle concerns reducing greenhouse gas emissions, and though primarily focused on mitigation, the strategies can also assist in adapting to a

Figure 5: Overarching direction and guidance provided by the SEQ Regional Plan for other planning activities



(after Low Choy, 2009)

changing climate, e.g. improving the energy efficiency of buildings, adopting efficient urban form (consolidating growth by supporting higher densities of energy-efficient building) and increasing planting of trees for shade and cooling to mitigate climate change impacts as well as reduce emissions.

The fourth principle is to “Increase the resilience of communities, development, essential infrastructure, natural environments and economic sectors to natural hazards including the projected effects of climate change” (Department of Infrastructure and Planning 2009a, p. 44) and so offers a specific focus on adaptation. This is supported by three policies and two programs to further implementation.

The first policy aims to “reduce the risk from natural hazards, including the projected effects of climate change, by avoiding areas with high exposure and establishing adaptation strategies to minimise vulnerability to riverine flooding, storm tide or sea level rise inundation, coastal erosion, bushfires and landslides”, while the second aims to reduce risk through the establishment of “adaptation strategies to minimise vulnerability to heatwaves and high temperatures, reduced and more variable rainfall, cyclones and severe winds, and severe storms and hail” (Department of Infrastructure and Planning 2009a, p. 44). The third principle mandates that all planning schemes and development decisions must take account of the potential sea level rises and the *Draft Queensland Coastal Plan* (Department of Environment and Resource Management 2009b). The supporting programs direct that all regional climate change adaptation policies are aligned and coordinated through the *SEQ Climate Change Management Plan* (Department of Infrastructure and Planning 2009b) and that new performance criteria are developed for planning and design to manage the risks of climate change.

Climate change adaptation issues are also considered with other DROs in the Regional Plan. DRO2, which concerns the protection and restoration of a healthy and resilient natural environment, includes a principle to

“maximise the resilience of ecosystems to the impacts of climate change.” (Department of Infrastructure and Planning 2009a, p. 48). DRO3 states that regional planning must ensure that regional landscape values are resilient to pressures including future climate change (Department of Infrastructure and Planning 2009a, p. 55).

Climate change is also identified as a key issue affecting profitability of the rural sector in DRO5. The other eight DROs do not mention climate change adaptation as an issue, though the focus on sustainability is clear throughout the report and this may be considered to include climate change impacts. However, the lack of explicit focus on climate change adaptation is particularly evident in the DROs concerning natural resources, infrastructure and water management.

Draft South East Queensland Climate Change Management Plan

The objective of the *Draft SEQ Climate Change Management Plan* is to “align and coordinate the implementation of regional policies to reduce greenhouse gas emissions and increase resilience to, and reduce risks from, natural hazards, including the projected effects of climate change.” (Department of Infrastructure and Planning 2009b, p. 17). The Climate Change Management Plan together with the Regional Plan have a key strategic role in guiding responses to natural hazards and climate change adaptation in the region in conjunction with other approaches such as the Disaster Management Plan (Department of Infrastructure and Planning 2009b, p. 16).

Actions in the draft plan align with the Regional Plan and relate to a range of planning decisions including development (and associated infrastructure) that is regulated through planning legislation. This includes local government planning schemes, structure or master plans and development applications made under the Integrated Development Assessment System (IDAS), state agency plans and policies, statutory and non-statutory planning actions, and planning support such as providing spatial information and planning guidance (Department of Infrastructure and Planning 2009b).

The Climate Change Management Plan contains five proposed programs with thirteen draft actions to implement the climate change adaptation policies of the Regional Plan (and ten programs with 19 draft actions for mitigation). The current status, either 'underway' or 'proposed', is indicated for each draft action, along with a proposed implementation sequence (either 'immediate priority' or 'follow up') and a proposed 'lead agency' to be responsible for implementation and suggested 'contributing partners'. The document also briefly describes the rationale for each action, the required steps to achieve it and its relationship to other actions or existing government programs (see Appendix 3).

SEQ Natural Resource Management Plan 2009-2031

The *South East Queensland Natural Resource Management Plan 2009-2031* connects the wide range of existing and future plans, strategies and actions to "coordinate the management and use of natural resources to enhance community, economic and environmental values" (Department of Environment and Resource Management 2009d, p.4). It sets measurable targets for air and atmospheric resources, coastal and marine, community engagement, land, nature conservation, regional landscape areas, Traditional Owner engagement and water.

The Natural Resource Management Plan deals with climate change indirectly. Some of the challenges resulting from climate change are mentioned and achievement of several of the specified targets will help improve the resilience of our natural resources to climate change. However, there is no explicit climate change adaptation strategy in the document. Achieving the targets will require adaptation to the effects of climate change.

6.4 Local policies and instruments

6.4.1 Adapting to climate change: A Queensland Local Government Guide

In 2007, the Local Government Association of Queensland produced *Adapting to climate change: A Queensland Local Government Guide* to help Councils throughout

Queensland assess the impacts of climate change on their diverse range of roles and responsibilities and plan appropriate responses. The Guide does not recommend standard solutions to specific problems but provides a process and tools to help Councils identify and respond to climate risks, including a decision-making framework, case studies and checklists (Local Government Association of Queensland 2007).

The important sectors include public safety, economic development, community and lifestyle, environment, financial and legal liabilities, and essential infrastructure.

6.4.2 SEQ Local authorities

This section reviews how local councils are taking climate change into account within their activities. It reviews only the councils which have either developed climate change plans/studies or included climate change considerations into some of their activities or plans, such as the corporate plans.

A more comprehensive review of whether and if so, how, the eleven SEQ local authorities currently address climate change impacts in their other plans, programmes and initiatives is summarised in Appendix 4. The review in Appendix 4 seeks to identify explicit or implied climate change references in the following local authority planning instruments/initiatives: Desired Environmental Outcomes (DEOs) from the statutory planning schemes; State of the Environment (or Sustainability) reports; Local Disaster Management Plans; and other miscellaneous plans.

In addition, it includes a preliminary assessment to identify individual local authority involvement in national and international climate change programmes, namely the previously mentioned Federal Government Local Adaptation Pathways Program (LAPP) and climate change programs of the International Council for Local Environmental Initiatives (ICLEI).

Brisbane City Council (BCC)

The *Brisbane City Plan for Action on Climate Change and Energy* resulted from a Climate Change and Energy Taskforce review of BCC's

vulnerability to climate change and what adaptive opportunities the council can adopt. The Task Force identified the following vulnerabilities in Brisbane due to climate change: sea level rise and storm surges, bushfires, lower rainfall, increased drought, increasing number of extreme hot days and an increase in the number of intense storms (Maunsell Australia 2007).

The Taskforce Report recommends that BCC undertakes a comprehensive assessment of climate change impacts on its infrastructure, implements measures to protect facilities at risk from storm surge or sea level rise where appropriate, relocates essential community facilities to low risk areas or introduces physical adaptations, and makes all BCC policies climate-proof (Maunsell Australia 2007).

It also recommended an assessment of vulnerable properties and people to climate change risks; a program with State government to reduce risk profile including local infrastructure upgrades and withdrawal from high risk areas; updating the Q100 flood line to accommodate sea level rise, and rate increases on high risk areas due to emergency management services and needs (Maunsell Australia 2007).

BCC has prepared two theoretical storm tide maps for the Taskforce in which a storm surge of five meters occurs during a cyclone with highest astronomical tide; the maps show the most vulnerable areas of such an event. Coastal settlements along the Brisbane River and along the shoreline are the most vulnerable (Maunsell Australia 2007), but no specific explanations are given of what kind of infrastructure would be inundated or the impacts of such inundation. Further analysis of these maps and the inundated areas would assist greatly in putting the Taskforce recommendations in action in practical terms, and also increase community's awareness of spatial vulnerability.

Based on the report, BCC adopted a *Plan for Action on Climate Change and Energy* in 2007 (Brisbane City Council n.d.). Action 6 confirms council's commitment to undertake

impact assessments regarding climate change and peak oil on all council infrastructure by 2012. Actions 10 and 11 concentrate on the role of community education and awareness of climate change and peak oil issues. Action 11 promotes community awareness, education of school children and raising awareness on emergency responses, water efficiency and coping with climate change impacts. Action 13 focuses on strategic land use planning and includes actions to upgrade the Q100 flood level and enhance stormwater and flood-related infrastructure requirements, and the need for shade and weather protection.

The *BCC Budget for 2009-2010* includes significant investment in climate change-related projects. Whilst the budget claims to include a focus on climate change adaptation, upon closer inspection, the projects listed appear to be mostly focused on mitigation. The Two Million Trees project and Green Heart CitySmart are two of the main initiatives.

The *WaterSmart City Strategy* includes a focus on flood management and water recycling, with the predicted outcomes of climate change incorporated into the planning.

Gold Coast City Council (GCCC)

The *GCCC Corporate Plan 2009-2014* addresses climate change adaptation and mitigation, with an analysis of the likely effects that climate change will have upon multiple sectors of the economy. It adopts the goal that by 2040, the GCCC will be "resilient, adaptive and maximise the opportunities presented by emerging challenges such as climate change" (Gold Coast City Council 2009a, p. 10).

Funded by Australian Government Local Adaptation Pathways Program the Gold Coast *Climate Change Strategy 2009-2014* focuses on developing community awareness and training programs for adaptation, reviewing asset maintenance requirements, reviewing and amending standards for infrastructure and assets, identifying and prioritising at-risk assets, creating a scoping study concerning local food production and developing and

implementing a foreshore management plan (Gold Coast City Council 2009b).

Moreton Bay Regional Council

The *Moreton Bay Regional Council Corporate Plan 2009-2014* is the first planning document made since the amalgamation of the former three shires (Pine Rivers, Caboolture and Redcliffe). The document looks at planning for effective growth management and makes a number of specific references to climate change. It acknowledges the need to address adaptation within the broader council's management framework and not only as a stand-alone policy. The council has articulated strategies for addressing adaptation, including identifying risk and the impacts of climate change, developing strategies to address these risks and working with stakeholders in creating plans (Moreton Bay Regional Council n.d.).

Climate change adaptation is mentioned throughout the plan's strategies, including ensuring planning avoids inappropriate development in high risk areas; ensuring best practice building standards and sustainability principles; acknowledging the increases in maintenance and replacement costs that will be associated with rising sea levels and changing weather; and addressing the present and future risks of mosquitoes, vermin outbreaks and changing vector-borne diseases resulting from climate change. The council has also created a disaster management guideline. Key hazards for the region included in the Plan are flooding, storm surge, storms, bushfires, landslides and transportation accidents (Moreton Bay Regional Council n.d.).

The *Caboolture Shire Plan* openly acknowledges that incorporating climate change modelling for storm surges will be essential in guiding the planning and siting of infrastructure and facilities. It focuses heavily on assessing the risks associated with bushfires, cyclones, earthquakes, flooding, heatwaves, landslides, severe storms and storm surges, though these hazards are not always explicitly linked to climate change. The importance of protecting and managing coastal wetlands and ensuring sustainable

coastal development is also noted (Moreton Bay Regional Council 2010).

The *Caboolture Shire Natural Disaster Risk Management Study* conducted by the Institute for International Development in 2007, provides a detailed account of the risks, threats and management practices for the shire, acknowledging the importance of accounting for future disaster risk in planning. An analysis of sectors likely to be exposed to disasters and hazards has been an important focus of the study, with the main sectors identified as buildings and property, people, essential infrastructure, economic activity and environment. Threats that were identified for the region include bushfires, floods, storms, landslides and heatwaves, seen as posing a significant potential risk. The strategies outlined in the report intend to protect the shire from significant threats in all but the most extreme of events (Institute for International Development 2007).

Disaster management plans provided in the study include construction standards for development in bushfire-prone areas. No building code yet covers landslides, inundation-prone areas or heatwaves and it is acknowledged that these areas need to be addressed. Climate change is mentioned four times within the report. The continuing rise in global temperatures is acknowledged and seen as important towards planning and accounting for future disaster risks. The analysis of hazards, risk and vulnerability has been completed with an understanding of climate change implications (Institute for International Development 2007).

A Scoping Study On Climate Change Risks (Climate Risk Ltd 2009) highlights the vulnerability to climate change of specific locations within the council, particularly Bribie Island, and urges the council to consider its own operations in all sectors. In addition, a storm tide hazard study for Moreton Bay Regional Council, Redland Shire Council and Logan City Council Government Areas was conducted in 2008. The study focused on storm tides, inundation mapping, vulnerability assessment and mitigation options (Cardno Lawson Treloar 2008).

Redland City Council

The *Redland Shire Council Corporate Plan 2006-2010* makes explicit reference to climate change and calls for community engagement regarding adaptation to the potential changes to the natural environment, sea levels, temperature, floods, storms and bushfires resulting from climate change (Redland Shire Council 2007). In addition, Redland City Council is currently preparing its *Risk Management Process and Climate Adaptation Plan*, funded through the Australian Government Local Adaptation Pathways Program.

Sunshine Coast Regional Council

The Sunshine Coast Regional Council is conducting a *Climate Change Risk Assessment and Action Plan* as part of the Commonwealth government's Local Adaptation Pathways Program, with a focus on climate change related risks and how these will impact the Sunshine Coast. Main areas of discussion are infrastructure under council jurisdiction, and its construction, maintenance and operational aspects under climate change. The plan aims to develop a comprehensive adaptation response after assessing the risks in question. The council has already conducted several risk assessment workshops, in which risks have been identified (Steele 2009).

The *Draft Climate Change Strategy 2009-2020* was released for public consultation in 2009. The Strategy includes 95 actions, which focus on four key policy areas: leadership, mitigation, adaptation, and energy transition (Sunshine Coast Regional Council 2009).

Ipswich City Council

The *Ipswich City Council Corporate Plan 2007-2012* identifies climate change as one of its key trends and drivers. It identifies possible impacts a changing climate will have on water availability and private assets due to extreme weather events, as well as the need to build community capacity (Ipswich City Council n.d.).

Funded by Australian Government Local Adaptation Pathways Program the Western Sub-Regional Organisation of Councils

(sponsored by Ipswich City Council and including Lockyer Valley Regional Council, Somerset Regional Council and Toowoomba Regional Council) has recently completed a regional *Climate Change Risk Assessment*. The assessment identified regional risks related to a number of climate variables, including reduced rainfall, increased temperature and extreme weather events (storms, flooding, bushfire) (InvesWest & City of Ipswich n.d.).

Logan City Council

The Logan-Scenic Rim Climate Adaptation project, funded through the Australian Government Local Adaptation Pathways Program, is still under development. The project will assist the two councils to develop a management process and an adaptation action plan by assessing the risks climate change will inflict on their region (Scenic Rim Regional Council 2008).

Scenic Rim Regional Council

The *Boonah Shires Futures* plan directly considers the impacts of climate change on agriculture and the need for adaptation strategies (Boonah Shire Council 2007).

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APPENDIX 1. Sector-Specific Research Questions.

Urban planning and management

1. What are possible landscape scale planning units in the region, based on landscape features, distinctive qualities, settlement patterns and ability to provide inter-organisation collaboration, suitable to implement climate change adaptation?
2. What is the most appropriate scale, both spatial and temporal, to deliver and implement climate change adaptation policies and actions?
3. How might the current institutional arrangements be remodelled to allow better integration and cross sectoral fertilisation of planning policy to assist in adapting to climate change in the context of urban and regional planning?
4. How can collaborative planning and management processes be improved to foster strategic partnerships and encourage consensus building to facilitate effective climate adaptation in SEQ?
5. Does the current planning system adequately engage the non-government sector (community and industry) to support climate change adaptation in SEQ?
6. What tools, strategies and mechanisms should planners employ to facilitate effective adaptation options given the plethora of climate change uncertainties?
7. How can statutory planning incorporate climate science to achieve climate adaptation in the SEQ context?
8. What are the implications for mitigation measures that might arise from climate adaptation options in the urban and regional context of SEQ?
9. What are the implications for adaptation options that might arise from mitigation measures in the urban and regional context of SEQ?

Coastal management

1. Which are the implications of climate change, including sea level rise and the variability of storms patterns, on the existing settlements and infrastructures?

2. Which are the implications of climate change, including sea level rise and the variability of storms patterns, on the existing coastal policy framework at the different levels of government?
3. What are the available adaptation options from a systems perspective, including engineering solutions, economic measures, improvement of the social adaptive capacity and the modification of the existing legal and administrative framework? How do these options interact?
4. How can coastal communities be involved to build consensus around climate issues and to identify and assess adaptation options?
5. How does coastal management interact with urban planning, emergency management and human health issues?

Emergency management

1. How will climate change affect the emergency management sector's capacity to work across the prevention, preparedness, response and recovery (PPRR) spectrum in SEQ?
2. Are current institutional, policy and regulatory arrangements and responsibilities for emergency management in SEQ well suited to handle the increasing demands of climate change?
3. How can emergency management agencies involved in the SEQ region ensure adequate resources in times of climate related disasters? What alternatives must be developed to ensure adequate resourcing when multiple events coincide?
4. How can individuals' and the community's resilience and ability to deal with increasing climate-related risks be enhanced, including by improving the efficacy of hazard awareness and preparedness strategies in the case study communities and in a range of demographic and socio-economic groups
5. What is the role of policy/market instruments in promoting effective private action on adaptation and community preparedness and response?

Human health

1. What are the key adaptation issues facing the health sector in dealing with climate change in SEQ?
2. At what level of government are climate change adaptation policies and programs related to human health most beneficial?
3. What is the interplay between the health sector and other governmental and non-government sectors/organizations, and how can programs and responses be tailored to work best across these programs and agencies?
4. What constraints exist within current and planned health programs or systems to effective adaptation to the impacts of climate change on human health?

APPENDIX 2. Human settlements preliminary list of stakeholders.

Project Reference Group

Department of Community Safety - Emergency Management Queensland
Local Government Association Queensland (LGAQ)
Queensland Council of Social Service
Department of Infrastructure and Planning (DIP)
SEQ Catchments
Council of Mayors (SEQ)
Friends of SEQ
Queensland Health
Urban Development Institute of Australia (UDIA)
DERM- Office of Climate Change

Queensland Coastal Councils Group
Queensland Conservation Council
Queensland Environmental Law Association
Queensland Farmers' Federation
Queensland Tourism Industry Council
Redland City Council
Scenic Rim Regional Council
SEQ Water
Somerset Regional Council
Sunshine Coast Regional Council
The Retailers Association (Brisbane)
Toowoomba Regional Council
Sunshine Coast Environmental Council
Surfrider Foundation Australia
Tourism Queensland

Primary, secondary and tertiary stakeholders across sectors

AgForce Queensland
Australian Institute of Landscape Architects (Queensland)
Brisbane City Council
Commonwealth Department of Climate Change
Commonwealth Department of the Environment, Water, Heritage and the Arts
Department of Transport and Main Roads - Maritime Safety Queensland
Environment Institute of Australia and New Zealand (Queensland)
Friends of Federation Walk
Gecko
Gold Coast City Council
Healthy Waterways
Ipswich City Council
Labrador Residents Association
Lockyer Valley Regional Council
Logan City Council
Main Beach Progress Association
Moreton Bay Regional Council
National Climate Change Adaptation Research Facility
National Retail Association (Queensland branch)
Office of Clean Energy (Queensland)
Planning Institute of Australia (Queensland Division)
Property Council of Australia (Queensland)

APPENDIX 3. Draft South East Queensland Climate Change Management Plan Rationale

Table 2. Summary of programs and draft actions for climate change adaptation.

Program K. *Reinforce and enhance government directives, guidance and mapping to reduce the exposure and vulnerability of communities, development and essential infrastructure to coastal hazards*

Draft action 20. Prepare a new Queensland Coastal Plan and supporting guidelines.

Draft action 21. Update the current guideline, Mitigating the adverse impacts of storm tide inundation to incorporate current climate change science.

Draft action 22. Implement the policies of the new Queensland Coastal Plan through regional and local planning, and development and infrastructure decision-making in SEQ.

Draft action 23. Acquire fine-scale digital elevation data for coastal areas for use in assessing risk and mapping hazard-prone areas in SEQ.

Draft action 24. Prepare and publish regional- and local-scale risk assessments and maps of coastal hazard-prone areas using the methodology, sea-level rise and storm-intensity factors in the new Queensland Coastal Plan.

Program L. *Reinforce and enhance government directives, guidance and mapping to reduce the exposure and vulnerability of communities, development and essential infrastructure to riverine flooding, bushfires, high temperatures and other relevant natural hazards*

- Draft action 25. Review and update State Planning Policy (SPP) 1/03—Mitigating the Adverse Impacts of Flood, Bushfire and Landslide, and develop supporting guidelines.

- Draft action 26. Develop guidelines for the preparation of hazard and risk maps including the projected effects of climate change on natural hazards within the scope of the revised SPP 1/03.

- Draft action 27. Develop a regional summary of projected climate change impacts for SEQ.

- Draft action 28. Prepare local-scale climate-resilient urban planning and design guidelines and performance criteria for sensitive areas.

Program M. *Reinforce and enhance research knowledge, and government directives, guidance and mapping to build the resilience of natural ecosystems to climate change*

Draft action 29. Improve understanding of the vulnerability of ecosystems to the impact of climate change in SEQ.

Draft action 30. Prepare regional and local adaptation strategies and programs to mitigate the impacts of climate change on natural ecosystems in SEQ.

Program N. *Reinforce and enhance government applications of research knowledge about climate change adaptation in SEQ.*

Draft action 31. Facilitate the uptake of research knowledge about climate change adaptation by SEQ local governments and state agencies

Program O. *Increase community awareness and influence behaviour regarding actions to build resilience to natural hazards and climate change in SEQ.*

Draft action 32. Develop and implement a communications strategy to support actions to build resilience to natural hazards and the projected effects of climate change in SEQ.

APPENDIX 4. SEQ Local Authorities Climate Change Initiatives Review

Brisbane City Council

The **City Plan 2000** serves as the council's current planning scheme. It makes no specific reference to climate change. A formal review of this plan is currently underway and expected to be completed in 2012.

The **CityShape Plan** is a growth management plan for Brisbane City from 2006 to 2026. It looks at how the city should be structured and aims to focus development around nodes and corridors. The impacts of climate change are not discussed.

The **Brisbane City Centre Master Plan** sets a strategic direction for the future development of the Brisbane city centre. This document does not specifically address climate change or climate change adaptation.

The **Brisbane City Plan for Action on Climate Change and Energy** resulted from a Climate Change and Energy Taskforce review of BCC's vulnerability to climate change and what adaptive opportunities the council can adopt. The Task Force identified the following vulnerabilities in Brisbane due to climate change: sea level rise and storm surges, bush fires, lower rainfall, increased drought, increasing number of extreme hot days and increase in the number of intense storms (Maunsell Australia 2007, p. iii).

The Taskforce Report recommends that BCC undertake a comprehensive assessment of climate change impacts on BCC infrastructure, implement measures to protect facilities at risk from storm surge or sea level rise where appropriate, relocate essential community facilities to low risk areas or introduce physical adaptations, and climate-proof all BCC policies (Maunsell 2007). It also recommended an assessment of vulnerable properties and people to climate change risks; a program with State government to reduce risk profile including local infrastructure upgrades and withdrawal from high risk areas; updating the Q100 flood line to accommodate sea level rise, and rate increases on high risk areas due to emergency management services and needs (Maunsell Australia 2007, p. 42).

BCC has prepared two theoretical storm tide maps for the Taskforce in which a storm surge of five meters occurs during a cyclone with highest astronomical tide; the maps show the most vulnerable areas of such an event. Coastal settlements along the Brisbane River and along the shoreline are the most vulnerable (Maunsell Australia 2007, p. 19), but no specific explanations are given of what kind of infrastructure would be inundated or the impacts of such inundation. Further analysis of these maps and the inundated areas would assist greatly in putting the Taskforce recommendations in action in practical terms, and also increase community's awareness of spatial vulnerability.

Based on the report, BCC adopted a Plan for Action on Climate Change and Energy in 2007 (BCC 2009). Action 6 confirms council's commitment to undertake impact assessments regarding climate change and peak oil on all council infrastructure by 2012 (BCC 2009, p. 7). Actions 10 and 11 concentrate on the role of community education and awareness of climate change and peak oil issues; Action 11 promotes community awareness, education of school children and raising awareness on emergency responses, water efficiency and coping with climate change impacts. Action 13 focuses on strategic land use planning and includes actions to upgrade the Q100 flood level, enhance stormwater and flood-related infrastructure requirements, and the need for shade and weather protection.

The **BCC Budget for 2009-2010** includes significant investment in climate change-related projects. Whilst the budget claims to include a focus on climate change adaptation, upon closer inspection, the projects listed appear to be mostly focused on mitigation. The Two Million Trees project and Green Heart CitySmart are two of the main initiatives.

The **WaterSmart City Strategy** includes a focus on flood management and water recycling, with the predicted outcomes of climate change incorporated into the planning.

The **Brisbane City Disaster Management Plan** provides guidance for the prevention, preparation, response and recovery from disasters arrangements in the community as well as disaster management related partnerships with other levels of government. It focuses on the minimisation of the effects of a disaster upon the community by outlining a disaster management system and identifying specific roles and responsibilities. The Plan also covers all phases of disaster management and provides a framework for sub-plans related to the mostly likely threats to the community, including severe storms, floods and fires (Brisbane City Council 2010).

Brisbane City Council also develop a **Brisbane Central Business District Emergency Plan** in partnership with Queensland Police and state government emergency agencies to compose a framework to guide the response to major emergency events within the Central Business District area (Brisbane City Council 2010).

Other council plans with a potential to deal with climate change include: Brisbane City Council Corporate Plan 2008-2012; Our shared vision – Living in Brisbane 2026; Brisbane Air Quality Strategy; Invasive Species Management Plan; Environmental Policy; Waste Minimisation and Management Strategy.

External initiatives

BCC participates in ICLEI's Oceania's Adaptive and Resilient Communities (ARC) program with a focus on adaptation and its Cities for Climate Protection (CCP) which focuses on mitigation.

Gold Coast City Council

The **Gold Coast Planning Scheme 2003** is the principal planning framework for development in Gold Coast city. It does not specifically address climate change, sea level rise or climate change adaptation, but does contain provisions relating to bushfire management, canals and waterways, flooding, erosion and unstable soils.

The **GCCC Corporate Plan 2009-2014** addresses climate change adaptation and mitigation, with an analysis of the likely effects that climate change will have upon multiple sectors of the economy. It adopts

the goal that by 2040, the GCCC will be "resilient, adaptive and maximise the opportunities presented by emerging challenges such as climate change" (Gold Coast City Council, 2009: 10).

The **Gold Coast City Climate Change Strategy 2009** includes a focus on developing community awareness and training programs for adaptation, reviewing asset maintenance requirements, reviewing and amending standards for infrastructure and assets, identifying and prioritising at risk assets, creating a scoping study concerning local food production and developing and implementing a foreshore management plan.

The **Gold Coast City Local Disaster Management Plan** provides guidelines for the coordination and management of resources prior, during and after a disaster in order to ensure community safety based on prevention, preparedness, response and recovery spectrum. The Plan is an evolving guide to disaster management underpinned by a comprehensive all-hazards and all-agencies approach (Gold Coast City Local Disaster Management Group 2009).

GCCC is finalising its **Shoreline Management Plan (SMP)**. The SMP, which is joint initiative between the GCCC, Griffith University, the Queensland Government and the Regional Natural Resource Management Board, will be a guideline for coastal management and development for the Gold Coast for the next 50 years. It pursues a whole-of-coastline perspective and includes notions of community, social, economic and environmental issues. The SMP notes that due to expected increases in the rate of coastal erosion, no development should be allowed in front of the A-line seawall, which runs along the shoreline (excluding The Spit and South Stradbroke Island). Erosion is expected to reach the seawall in the next fifty years and therefore infrastructure investments in front of the wall will be lost.

External initiatives include GCCC's participation in ICLEI's Oceania's ARC program with a focus on adaptation and its CCP which focuses on mitigation.

Ipswich City Council

The **Ipswich Planning Scheme 2006** contains a provision allowing the clearing of vegetation for firebreaks but there is no specific mention of climate change. The Ipswich Corporate Plan 2007-2012 identifies climate change as a key trend for the city.

The Ipswich and Somerset Councils have recently completed a regional climate change risk assessment - **Adapting to Climate Change: A Community and Council Response** - with funding from the Department of Climate Change.

Lockyer Valley Regional Council

Neither the **Gatton** nor **Laidley Shire Planning Schemes** specifically address the issue of climate change but the Gatton Scheme does identify areas which may be susceptible to land degradation, erosion, and landslides and aims to minimise degradation. The plan extensively addresses fire control and mentions microclimate ventilation.

The **Laidley Shire Planning Scheme** includes regulations requiring development assessment to consider erosion control and storm water management measures. The plan requires an analysis of flooding problems within an environmental management plan as well as stormwater drainage.

Logan City Council

The **Logan Planning Scheme 2006** contains references to flood control and vegetation management, but does not specifically address climate change adaptation. The Logan-Scenic Rim Climate Adaptation project, funded through a Department of Climate Change LAPP grant, is still under development. The 2001 **Logan City State of the Environment Report** makes significant reference to the Cities for CCP. The report also includes reference to fire and vegetation management schemes but does not specifically address climate change adaptation.

Moreton Bay Regional Council

The **Moreton Bay Regional Council Corporate Plan 2009-2014** is the first planning document made since the amalgamation of the former three shires (Pine Rivers, Caboolture and Redcliffe). The document looks at planning

for effective growth management and makes a number of specific references to climate change. It acknowledges the need to address adaptation within the broader council's management framework, not only as a stand-alone policy. The council has articulated strategies for addressing adaptation, including identifying risk and the impacts of climate change, developing strategies to address these risks and working with stakeholders in creating plans.

Climate change adaptation is mentioned throughout the plan with strategies including: ensuring planning avoids inappropriate development in high risk areas; ensuring best practice building standards and sustainability principles; acknowledging the increases in maintenance and replacement costs that will be associated with rising sea levels and changing weather; and addressing the present and future risks of mosquitoes, vermin outbreaks and changing disease vectors resulting from climate change. The council has also created a disaster management guideline. Key hazards for the region that were listed included flooding, storm surge, storms, bushfires, landslides and transportation accidents.

The **Pine Rivers Planning Scheme** contains no specific reference to climate change but does address stormwater management systems and fire hazards, especially in regards to subdivisions and developments. The **Redcliffe Planning Scheme** does not contain any specific reference to climate change, but covers erosion control measures for developments.

The **Caboolture Shire Plan** openly acknowledges that incorporating climate change modelling for storm surges will be essential in guiding the planning and siting of infrastructure and facilities. It focuses heavily on assessing the risks associated with bushfires, cyclones, earthquakes, flooding, heatwaves, landslides, severe storms and storm surges, though these hazards are not always explicitly linked to climate change. The importance of protecting and managing coastal wetlands and ensuring sustainable coastal development is also noted.

The **Caboolture Shire Natural Disaster Risk Management Study** conducted by the Institute for International Development in 2007, provides a detailed account of the risks, threats and management practices for the shire, acknowledging the importance of accounting for future disaster risk in planning. An analysis of sectors likely to be exposed to disasters and hazards has been an important focus of the study, with the main sectors identified as buildings and property, people, essential infrastructure, economic activity and environment. Threats that were identified for the region include bushfires, floods, storms, landslides and heatwaves, seen as posing a significant potential risk. The strategies outlined in the report intend to protect the shire from significant threats in all but the most extreme of events.

Disaster management plans provided include construction standards for development in bushfire-prone areas. No building code yet covers landslides, inundation-prone areas or heatwaves and it is acknowledged that these areas need to be addressed. Climate change is mentioned four times within the report. The continuing rise in global temperatures is acknowledged and seen as important towards planning and accounting for future disaster risks. The analysis of hazards, risk and vulnerability has been completed with an understanding climate change implications.

The **Pine Rivers Energy Management Plan** makes no reference to climate change. It does, however, address issues which relate to climate change adaptation, such as managing development to maintain a low level of risk exposure to natural hazards, avoiding erosion-prone regions, considering the nuisances of mosquito and biting midges for new developments and minimising the risk of inundation to downstream properties caused by new developments.

Woorim Beach Shoreline Erosion Management Plan

Woorim Beach on Bribie Island has seen extensive shoreline recession combined with erosion, which initiated the need to undertake an erosion study leading to a management plan. Woorim Beach Shoreline Erosion Management Plan was published in

2007 with recommendations to strengthen the dunes through planting and adding sand to the shoreline to increase the dune formations. This Plan suggests that properties and facilities existing now in the erosion prone area should either be protected or prepared for retreat. The current dune width to protect the developments is inadequate ranging from 15 to 35 meters, whereas Environmental Protection Agency recommends 140 meter width. The report acknowledges that retreat involves significant costs and concludes that the option is currently socially unacceptable.

The Council has undertaken sand replenishment schemes according to the plan; however, groups such as the Friends of the Woorim Beach, a local non-government organisations, have seen little other activity that follows the recommendations (Oxenford 2009). Friends of Woorim Beach obtained funding for dune restoration through the replant of 15,000 plant specimens.

Storm tide Study

A storm tide hazard study for Moreton Bay Regional Council, Redland Shire Council and Logan City Council Government Areas was conducted in 2008 by Cardno Lawson Treloar. The study aimed to a) Prepare storm tide and joint occurrence wave parameters of events from 50 to 10,000 years Average Recurrence Interval (ARI) for present and future climate scenarios throughout the study area, b) Prepare inundation mapping of the Local Government Area for selected ARI events, and c) Undertake vulnerability assessment and address mitigation options. MBRC also commissioned a scoping study on climate change risks, which was conducted by Climate Risk Ltd in 2009. The study highlights the vulnerability especially of Bribie Island to climate change impacts as noted by **Caboolture Shire Natural Disaster Risk Management Study** (International Institute of Development 2007) and urges the council to consider its own operations in all sectors.

Redland City Council

The **Redlands Planning Scheme** does not refer to climate change in setting the desired outcomes for the shire, but codes and assessment criteria within the scheme may assist in adaptation to climate change, such as the Erosion Prevention and Sediment Control Code, storm water management code and climate response assessment criteria. There is significant focus on fire and flood management, maintaining natural drainage systems and minimising the impacts of natural hazards upon the shire. The DEOs address erosion, siltation and stormwater management, which may also assist in climate change adaptation.

The **Redland Shire Council Corporate Plan 2006-2010** makes explicit reference to climate change and calls for community engagement regarding adaptation to the potential changes to the natural environment, sea levels, temperature, floods, storms and bushfires resulting from climate change.

The **Redland State of the Environment Report 2008** focuses on the identification and monitoring of key environmental issues recognised by the community and other State of the Environment reports. These include atmosphere, waterways, biodiversity, land, human settlements and cultural heritage. Of particular interest here is the section on human settlements which acknowledges the existence of large areas prone to flooding and poor drainage systems within the council boundaries. These flood prone areas are mostly located along creeks and catchments; however, the nearby Brisbane and Logan rivers are more likely to contribute to larger-scale floods. The report highlights that, for some areas, the distinction between areas prone to flood and storm tide is artificial as these areas are likely to be affected by both. Areas affected the most by storm tide are found in Birkdale, Thorneside, Wellington Point, Thornlands, Victoria Point, and Redland Bay.

The **Eco Office Program** has occurred through the Ecobiz and CCP programs and is a part of the Local Greenhouse Action Plan. It includes the promotion of energy and water efficiency within council workplaces. It is focused mainly

on climate change mitigation, however it will assist in climate change adaptation through transitioning to lower energy and carbon usage.

The **Redland Landslide Hazard Assessment** examined the risk of landslide hazards and created an overlay code consistent with the SPPs and Draft Redland Planning Scheme. Whilst climate change is not explicitly referred to within the report, the review of landslide risk and management practices will be beneficial in assisting the shire to respond to increased landslide risk that may be associated with climate change.

The **Redland City Council Operational Plan 2009-2010** indicates that the council plans to develop a Shoreline Erosion Management Plan and conduct priority planning for the long-term management of the revetment walls.

Scenic Rim Regional Council

The **Boonah Shire Planning Scheme** includes recommendations for residential development design to suit the climate, however it makes no specific reference to climate change. The **Boonah Shires Future Plan** directly considers the impacts of climate change on agriculture and the need for adaptation strategies.

The **Beaudesert Shire Planning Scheme** makes no specific reference to climate change although a DEOs requires development to minimise natural hazards.

The **Logan-Scenic Rim Climate Adaptation project** has been funded through a Department of Climate Change LAPP grant and is still under development.

Somerset Regional Council

The **Esk Shire Planning Scheme** addresses risk associated with fire, flooding and similar hazards but provides no specific reference to climate change. The DEOs seek to manage and maintain the biodiversity and ecological processes of the shire.

The **Kilcoy Shire Planning Scheme** does not contain any specific reference to climate change but discusses in detail the risks and management of flooding, bushfires and erosion.

Adapting to Climate Change: A Community and Council Response, is a joint initiative with Ipswich City Council, funded through the Department of Climate Change LAPP Grant.

Sunshine Coast Regional Council

The Maroochydore Planning Scheme makes no mention of climate change. There are DEOs relating to biodiversity and natural area conservation.

The Caloundra Planning Scheme makes no specific mention of climate change or adaptation, but does provide flood and bushfire hazard plans.

The Noosa Planning Scheme makes no mention of climate change adaptation. Sea level rise is not addressed, but flood and fire management are discussed.

The Sunshine Coast Regional Council is conducting a **Climate Change Risk Assessment and Action Plan** as part of Commonwealth government's Local Adaptation Pathways Program, with a focus on climate change related risks and how these will impact the Sunshine Coast (Steele 2009). Main areas are infrastructure under council jurisdiction, and its construction, maintenance and operational aspects under climate change. The plan aims to develop a comprehensive adaptation response after assessing the risks in question. The council has already conducted several risk assessment workshops, in which risks have been identified (Steele 2009).

One extreme risk is increased erosion and loss of beaches, which directly links to loss of tourism and economic assets. Fourteen issues have been identified as high risk, and include: 1) Increased flooding and erosion of roads; 2) Increased tree falls across roads due to strong winds; 3) Inadequate storm water drainage capacity; 4) Saltwater intrusion into drainage systems not designed for salt water; 5) Increased erosion along natural waterways; 6) Changes in water quality of major lakes and wetlands; 7) Decreased structural stability of bridges due to increase in water flow/pressure; 8) Reduced effectiveness of sea walls and groynes; 9) Increased damage to

buildings due to changes in climate characteristics; 10) Increased bushfire risk to buildings; 11) Increased use of energy for cooling; 12) Increased intensity of heat from heat sinks; 13) Increased natural disaster impacts on parks and open space areas, and 14) Loss of landfill capacity after cyclone or severe storm (Steele 2008, p. 12-14).

The **Sunshine Coast Climate Change Strategy and Action Plan** was released for public consultation in 2009. The Action Plan includes 95 actions, which focus on four key policy areas: mitigation, adaptation, and energy transition and leadership. The council has also commenced development of a **Shoreline Erosion Management Plan**.

The **Sunshine Coast Local Disaster Management Plan** adopts a comprehensive, all agencies and all hazards approach. It establishes the arrangements and strategies required to prevent, prepare for, respond to and recover from the effects of disasters in the region.

Toowoomba Regional Council

The planning schemes of the various shires which amalgamated to form the Toowoomba Regional Council make no specific reference to climate change. Many do, however, make substantial reference to mitigating and managing the impacts of floods, fires, landslides and natural disasters (Pittsworth, Rosalie, Millmerra, Clifton, Cambooya, Toowoomba). The **Crows Nest Shire Planning Scheme** and **Jondaryan Planning Scheme Area** (Oakey) contain references to stormwater and water supply planning.