QRA QUEENSLAND RECONSTRUCTION AUTHORITY

Queensland Flood Risk Management Framework

Queensland Government

Document details

Security classification	Public
Date of review of security classification	June 2021
Authority	Queensland Reconstruction Authority
Document status	Final
Version	1.0
QRA Reference	DOC/21/23368 GD/0590

Interpreter

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Introduction

Background

Flooding causes more damage in Queensland than any other natural hazard. Since its establishment in 2011, Queensland Reconstruction Authority has administered more than $16.4 billion in disaster recovery funding, with about 85 per cent of this flood-related.

Queensland has repeatedly demonstrated its strong and resourceful capabilities in response and recovery, and these efforts are coming under recurrent and sustained pressure. As our population grows and the impacts of a changing climate result in an increased frequency of large-scale, destructive flood events, more needs to be done to prepare for and prevent the detrimental impacts of flooding on our communities.

In Queensland, governance of flood risk management is based on a collaborative, decentralised model with shared roles and responsibilities. Responsibility for flood risk management generally rests with local governments, as they are the major service provider to communities and are responsible for managing local development. Governance and flood risk management related policies in Queensland are dispersed across various state-level agencies to support decision making by local governments.

In addition, contemporary practices recognise that flood risk management requires a multi-disciplinary, integrated approach and aims to harness the skills and knowledge of a wide range of stakeholders. For the governance model to be successful, the roles and responsibilities of each stakeholder need to be articulated and understood. Close collaboration between the various partners is needed to achieve optimal outcomes. Local governments are the major service provider to communities, are responsible for managing local development, and managing disasters through the Local Disaster Management Group.

The *Queensland Flood Risk Management Framework* (herein the Framework) sets the direction for flood risk management in the state. It builds on and replaces the *Strategic Policy Framework for Riverine Flood Risk Management and Community Resilience 2017.* The Framework aligns with the *National Disaster Risk Reduction Framework* (2018), the *Queensland Strategy for Disaster Resilience* (2017), and has been developed consistent with the principles of the *Queensland Emergency Risk Management Framework* (2017) (QERMF).

Appendix A provides a further discussion on the existing legislative and policy landscape.

This Framework was developed by the Queensland Reconstruction Authority (QRA) as the state agency responsible for coordinating the development and implementation of whole-of-government policies for managing flood risks, in consultation with other relevant Queensland Government agencies.

Purpose

The *Queensland Strategy for Disaster Resilience* (2017) sets the foundations for Queensland to be the most disaster resilient state in Australia. To help achieve resilience with respect to managing the impacts of flooding, the Queensland Government recognises it needs to:

- better understand our flood risk through the application of consistent, best-practice assessment methodologies
- better understand flood risks able to be managed at the local level and the growing residual risks and areas of unacceptable risks that need to be managed and mitigated at the state level
- manage our growing response and recovery burden through greater investment in preparedness and prevention
- consider strategies to gradually reduce the impacts of the legacy flooding issues associated with past planning decisions
- build capacity and capability for effective flood risk management at all levels.

The purpose of this Framework is to address these needs, by providing clarity and understanding of expectations and responsibilities to guide and support decision-making by councils.

Scope and intended audience

This Framework applies to managing floods in urban, rural and remote areas of Queensland, resulting from:

- catchment flooding, including rivers and other watercourses, overland flow paths and groundwater systems as a result of prolonged or intense rainfall
- coastal flooding due to tidal or storm-driven coastal events, including storm surge in lower coastal waterways (excluding tsunamis).

The Framework is intended for use by those with roles in understanding and managing flood risks and its consequences on the community. This may include emergency management practitioners, flood risk managers, land use planners, engineers, hydrologists, infrastructure providers, and policy and decision makers within government and the broader industry.

Flood risk management

Flood risk management requires a multi-disciplinary, coordinated approach in order to be successful. The goal is for sustainable practices that improve community resilience and provide long-term benefits to the built and natural landscapes.

Flood risk management involves the full spectrum of stakeholders, from communities and private industry, to local, state and national governments and non-government organisations. It includes arrangements about managing the potential adverse effects of floods - for example, arrangements for mitigating, preventing, preparing for, responding to and recovering from a disaster.

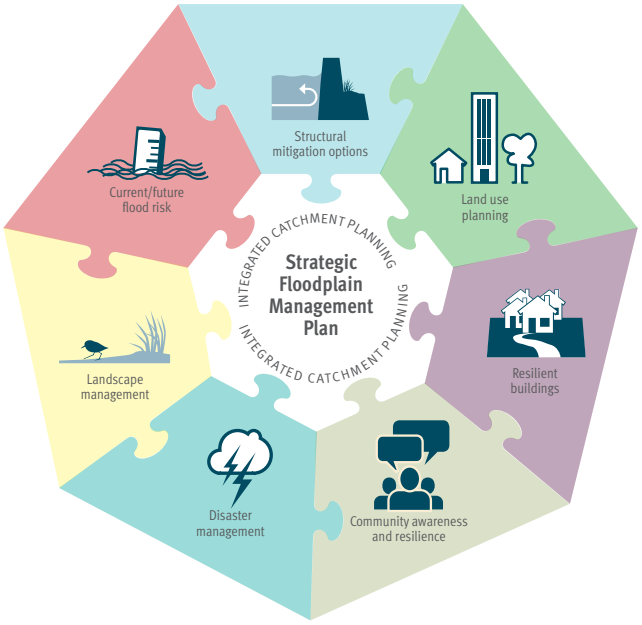


Figure 1: Intergrated flood risk management planning

It involves consideration of the full range of management options, including the best use of land, design of built form, land and water management practices, as well as disaster management, community resilience and response management, and structural mitigation.

It is also necessary to acknowledge the alternate cycles of drought and floods commonly experienced in Queensland, the need and desire for urban and economic growth and protection of our habitats and ecosystems.

Management of our floodplains should be based on best practice, which promotes tailored, proportionate assessment that provides an understanding of flood behaviour so that the full range of flood risk to the community can be understood and effectively communicated. This leads to informed decisions on the management of risk, as well as economic investment in development and infrastructure on floodplains.

Effective and strategic flood risk management is important for the long-term ecological, social and economic sustainability of Queensland.

Managing the risk of flooding in Queensland

Governance arrangements, policies and legislation related to flood risk management in Queensland is dispersed across various state-level agencies, to support decision making by local governments as the main service provider to communities.

Legislation dealing with flood risk management in Queensland covers issues ranging from planning and corporate responsibility to emergency response. The principal legislation, set out in more detail in **Appendix A**, are:

- *Queensland Reconstruction Authority Act (2011)*
- *Planning Act 2016 (Queensland)*
- *Disaster Management Act 2003 (Queensland)*
- *Building Act 1975 (Queensland)*
- *Local Government Act 2009 (Queensland)*
- *River Improvement Trust Act 1940 (Queensland).*

The flood risk management process promoted in this Framework is built on the national handbook *Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia* (Handbook 7) (AIDR, 2017), involving a staged process that leads to flood risk management outcomes, as shown in the following diagram.

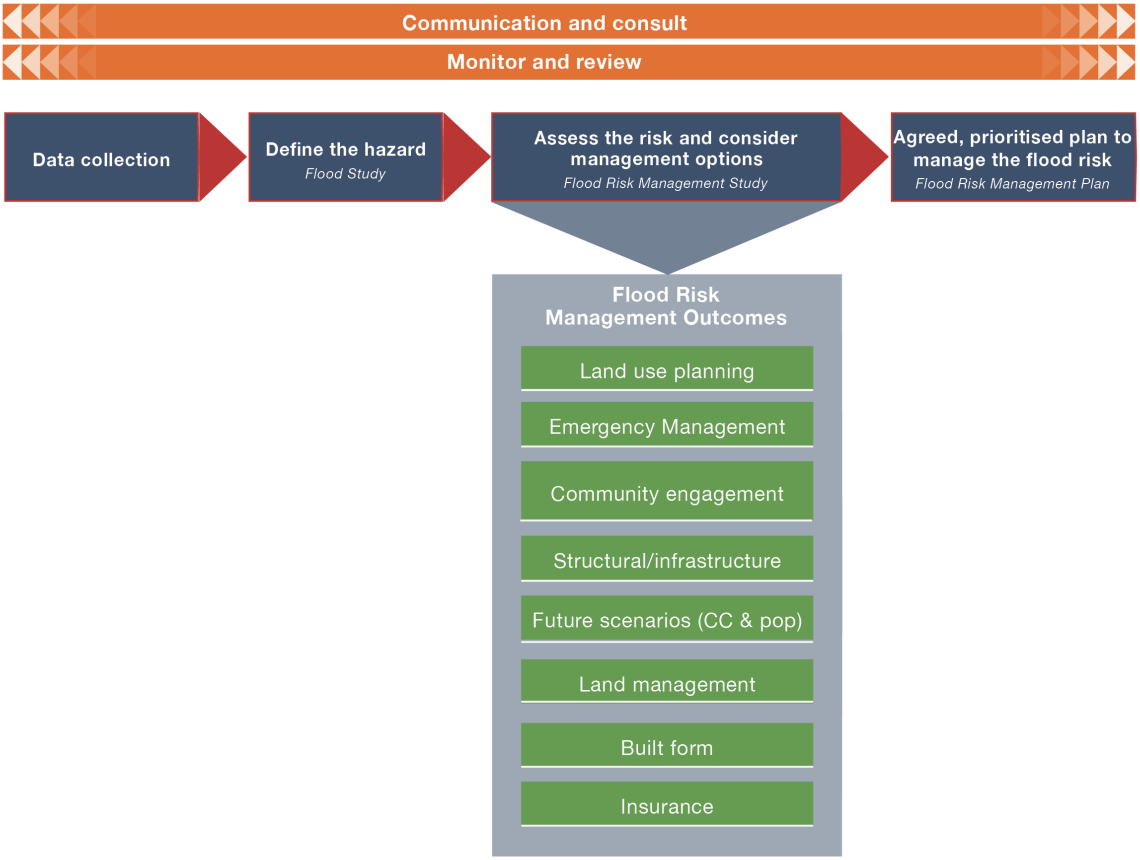


Figure 2: Flood risk mamangement process

The process and outcomes can be tailored to apply to the local, regional and state level. In its simplest forms, the process involves:

- collecting the necessary data
- defining the flood hazard
- assessing the risk, considering options to manage the risk to acceptable levels
- developing an implementation plan to manage the risk.

The Framework is informed and/or supported by the processes of monitoring and review, and communication and consultation.

The terminology used throughout this document, such as *flood study* or *flood risk management study*, is used simply to show alignment with national guidelines. It can be altered to suit the scale of the assessment and the objective of the works. For example, in some areas, the assessment of flood risk may form part of an overarching all-hazards assessment, rather than a discrete process. Furthermore, not all of the stated flood risk management outcomes will be appropriate to all locations, or addressed through a single project or assessment.

Readers of this document should therefore focus on the intent and objectives of the process, tailoring them to their specific needs and context.

Building capability and capacity

The United Nations Office for Disaster Risk Reduction (UNDRR) developed a *Strategic Approach to Capacity Development for Implementation of the Sendai Framework for Disaster Risk Reduction* (May 2019), which provides generalised advice on the capacity development roles and responsibilities of various disaster risk reduction stakeholders, and high-level guidance on priority areas for action.

The following areas for building capacity and capability are based on the four domains identified in the UNDRR Strategic Approach that generally have the greatest influence on capacity development:

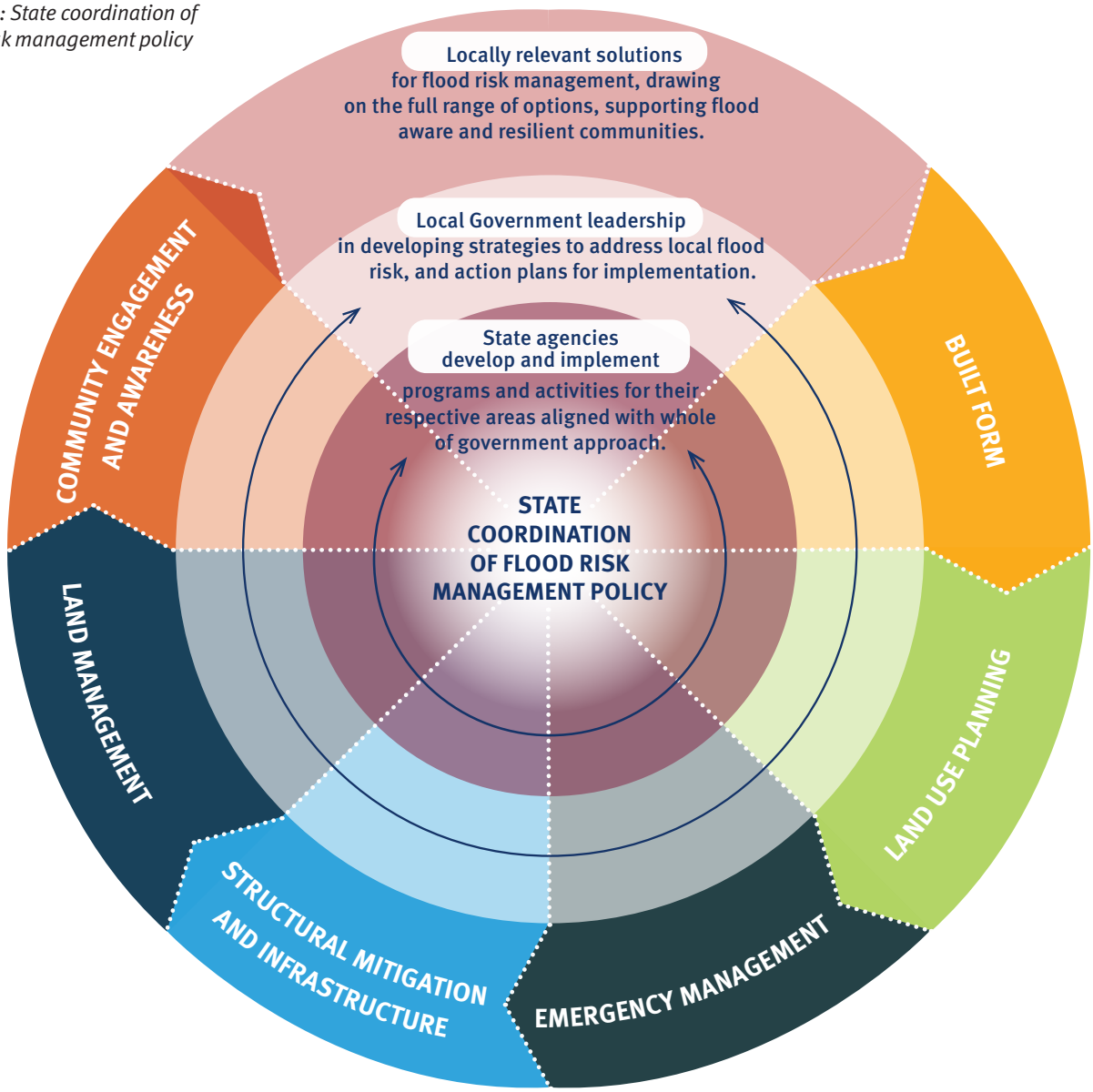
- Leadership
- Institutional strengthening and development (Governance)
- Accountability
- Knowledge

This Framework uses these four areas as the vehicle to achieving a strong understanding of current and potential future flood risk in Queensland, greater investment in preparedness and prevention, and capacity and capability across all flood risk management stakeholders.

Leadership

Leadership, according to the UNDRR Strategic Approach, is the ability to influence, inspire and motivate others to achieve or even go beyond their goals. It is also the ability to anticipate and respond to change. Leadership is not necessarily synonymous with a position of authority, it can also be informal and be held at many levels. Leadership development programs, strategic planning exercises, promotion of peer-to-peer mentoring, and identifying and supporting champions of change are all measures that support leadership capacity.

Figure 3: State coordination of flood risk management policy



The delivery of flood risk management in Queensland is via a collaborative dispersed model *(see Figure 3)* . Roles and responsibilities (set out in more detail in the following section) are dispersed between and across levels of government, along with key actions by industry.

Leadership operates at various levels and functions, including the coordination of strategic policy, implementation and reporting. A clear understanding of how leadership operates is essential for the dispersed model to be effective.

In Queensland, implementation of the dispersed model includes functional areas across and within state agencies and local governments.

State agencies supporting leadership and decision-making responsibilities of local governments are:

- Queensland Reconstruction Authority (QRA)
- Department of Regional Development, Manufacturing and Water (DRDMW)
- Department of State Development, Infrastructure, Local Government and Planning (DSDILGP)
- Queensland Fire and Emergency Services (QFES)
- Department of Environment and Science (DES)
- Department of Energy and Public Works (DEPW)
- Department of Transport and Main Roads (DTMR)
- Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships (DSDSATSIP)

Formal collaboration is managed within the Queensland Resilience Coordination Committee (QRCC).

In accordance with the *Queensland Reconstruction Authority Act 2011*, one of the main functions of QRA is to coordinate the development and implementation of whole-of-government policies for managing flood risks. This sits within QRA's broader remit to provide for appropriate measures to improve the resilience of communities for potential disasters and mitigate against potential disasters for affected communities.

This coordination role requires other core agencies to lead the development and implementation of their respective activities within the dispersed model approach in Queensland to support decision making by local governments *(refer Tables 1 to 7)*. This includes engaging Aboriginal and Torres Strait Islander councils to meet their specific needs in line with the Local Thriving Communities reform agenda to embrace local leadership in decision-making. Acknowledging a varying levels of capacity and capability of local governments, the activities of the core agencies include the development and implementation of programs, policies and guidance material, as well as the administration and allocation for funding programs. Local governments in turn are well placed to provide leadership at the local level by using the full suite of instruments available to them.

Some good practice examples of leadership at different levels in flood risk management in Queensland are included below.

FLOOD RISK ASSESSMENT PLANNING EVALUATION AND SCHEME AMENDMENT (FRAPESA) PROJECT

Toowoomba Regional Council embarked on one of the largest and most ambitious bodies of flood risk assessment undertaken by a local government in Australia.

It delivered multiple flood studies for 30 townships and the Condamine River catchment, along with comprehensive recommendations to better regulate development to protect people, property, infrastructure and the environment from flooding.

This project identified areas of flood risk across the region and assisted in putting in place a robust set of planning regulations.

BRISBANE CITY COUNCIL – FLOOD RESILIENT HOMES PROGRAM (PILOT)

This program is designed to help residents prepare for and recover from overland flow flooding. This voluntary program is currently being trialled in locations across the city that have a history of this type of flooding. The Flood Resilient Homes Program consists of a free in-home service, tailored recommendations, and an incentive scheme.

www.citysmart.com.au/floodwise

*"The **Brisbane River Strategic Floodplain Management Plan** is an outstanding example of how locally-led, regionally-focused and state-supported resilience can achieve improvements for all parts of the community."*
(Queensland Resilience Awards 2019)

It is a resource for state and local governments to enable the coordinated implementation of flood resilience actions over time. Its purpose is to facilitate regionally consistent flood risk management outcomes for the region, with flexibility in local implementation approaches and processes. It does not alter the statutory effect of existing legislation and policy.

Governance (roles and responsibilities)

Flood risk management extends to a broad range of government and private sectors and stakeholders, and is closely linked with many policy directives and other functions of government. Across the board, there is a need for stakeholders to work together, as well as integrate flood risk management considerations into their work.

In recognition of the decentralised approach to flood risk management in Queensland, overall governance requires a clear articulation of roles, responsibilities and expectations. Governance arrangements are set out in the following tables, and are framed around the core stages of the flood risk management process from Handbook 7.

Formal collaboration is managed within the QRCC and reported to the State Disaster Coordination Group (SDCG).

Tables 1 to 6 outline the **process** of flood risk management, whilst Table 7 details the **outcomes** sought to be achieved through implementation.

Compliance with the processes outlined below, may be used to demonstrate the need, and support applications, for funding in these areas.

Data collection and information provision

Collecting, maintaining, using and sharing the best available information, including post-event data collection and information, and outputs from floodplain-specific investigations.

Table 1 – Data collection and information provision

Expectations	**All stakeholders:** • develop, maintain and make publically available databases of relevant flood information • invest and maintain the flood warning infrastructure network across the state • collaborate on the collection of post-event data • analyse and share historical events data for use in hydrologic and hydraulic model calibration and verification, hazard identification and risk assessments • flood data is publicly available and accessible.
Responsibilities *There are a range of stakeholders responsible for data collection and the provision of information.*	**Local governments:** • primary responsibility for data collection and analysis at the local level, including the installation and maintenance of flood information network (gauges and supporting infrastructure) • publish flood study results • provide GIS layers of mapped extents on their website, and share with state government and ICA. **DRDMW:** • manage a network of river and rainfall gauges for water resource assessment and management purposes, and collect hydrological records and data which contributes to the Queensland flood warning network • publish approved dam emergency action plans • water planning (modelling for water resource plans and allocations). **Department of Resources:** • data storage and publication of flood studies, flood maps and other flood information prepared by the state and local governments • ensure accessibility of the above and share data with ICA and Geosciences Australia. **QFES:** • delivery of the Queensland Disaster Management Data Coordination Initiative (QDMDCI) • undertake damage assessments following events • oversight of the QERMF Risk Assessment Tool (to be replaced by the Queensland Risk Information Portal).

	DES: • coastal, vegetation and wetlands monitoring and mapping (base mapping) • data storage of hydrologic models • maintain the Queensland storm tide monitoring network to support disaster planning and response • statewide storm tide inundation mapping • undertake post-event storm tide inundation mapping surveys for significant events • provide climate projection data and maintain the Queensland Future Climate Dashboard. **Bureau of Meteorology:** Responsible for flood monitoring and prediction, and for the dissemination of riverine flood forecasts and warnings, as per the National Arrangements for Flood Forecasting and Warning. These activities include: • collection and publication of rainfall and river level data • routine monitoring of flood potential • issuing and the communication of flood watches and warnings • owning and maintaining flood warning infrastructure • maintaining a national database of rainfall/river monitoring metadata required for flood warning purposes • publishing reports on historic and or significant events. **QRA:** • facilitate best practice flood warning gauge network • support QFES in undertaking damage assessments following events. **Dam owners:** • prepare emergency action plans and make available any data that supports flood risk management • publish flood manuals for dams • prepare flood event reports for prescribed flood mitigation dams in accordance with the *Water Supply (Safety and Reliability) Act 2008*. **Office of the Coordinator-General (OCG):** • under the State Development and Public Works Organisation Act 1971, provide assessment, evaluation and facilitation of coordinated projects, undergoing an Environmental Impact Statement (EIS), including water infrastructure projects, as well as projects that may have an impact on, or from flooding, or located within a flood plain • As part of OCG's assessment process baseline information and data is collected at the EIS stage of a coordinated project assessment.

Flood study

Understanding flood behaviour, which includes an assessment of a range of potential flood events under current and potential future conditions, including climate change; defining the flood function of the area, particularly conveyance and storage areas; variation in flood hazard across the floodplain; and the interaction of the flood with the landscape, which can isolate areas from flood-free land and result in difficult evacuation situations.

Table 2 – Flood study

Expectations	**Flood studies and associated reports and maps will be:** • fit for purpose • based on an appropriate study area and not constrained by jurisdictional boundaries • the basis for identifying priority flood risk areas for more detailed assessment in accordance with Handbook 7 / Australian Rainfall and Runoff 2019 guidance • made available on local authority websites (GIS and PDF), and shared with the state government and Insurance Council of Australia (ICA) under Creative Commons licensing • supported by appropriate guidance provided by the state, including methodologies for undertaking flood studies.

Responsibilities	**DRDMW:** • provide technical support and advice on flood studies and flood mapping. **QRA:** • identify priority catchment areas • coordination of funding streams to support delivery of resilience projects. **Local governments:** • undertake flood studies for catchments within their area/shared with neighbouring local government areas • publish flood study results • provide GIS layers of mapped extents on their website, and share with state government and ICA. **DES:** • provide technical support and advice on storm tide studies and inundation mapping.

Flood risk management study (FRMS)

Assessment of the risk of flooding informed by the QERMF process by considering the potential hazard, exposure and vulnerability of the community and assets, and local tolerability.

Identifying areas of unacceptable risk, developing and assessing the full range of potential multi-disciplinary management options.

Table 3 – Flood risk management study

Expectations	**A FRMS will:** • be undertaken for priority catchments following the completion of a flood study, consistent with Handbook 7 and the QERMF • include assessment of the consequences of flood impact to the community, built environment, and natural environment and all potential options to manage residual risk • undertake multi-criteria and economic assessments in accordance with the *Framework for the Economic Assessment of Flood Management Projects* (2021) • include economic assessments that capture the costs and benefits of existing and proposed floodplain development and infrastructure and flood mitigation measures • include assessment of multi-disciplinary strategies/coordination measures for mitigating flood impacts • be informed by consultation with local community • seek to achieve flood risk management outcomes (set out in Table 7) and be transparent in any trade-offs which may result through the implementation of strategies.
Responsibilities	**QRA:** • identify priority catchments/areas to undertake FRMS • coordinate funding streams that may support delivery of FRMS • publish and maintain supporting guidelines, including the *Framework for the Economic Assessment of Flood Management Projects* (2021). **QFES:** • facilitate the implementation of the QERMF. **Local governments:** • undertake FRMS in consultation with local community and stakeholders. **DRDMW:** • provide advice when requested on floodplain management and in particular for prescribed flood mitigation dams and Category 3 levees.

Flood risk management plan (FRMP)

Prioritised and agreed plan of actions that will manage the flood risk to acceptable limits. The actions will vary based on the scale of the project, the flood hazard, and the community and stakeholder tolerability of risk.

Table 4 – Flood risk management plan

Expectations	**A FRMP should include:** • a prioritised plan of actions which considers funding, time periods and responsible agents. It will seek to achieve flood risk management outcomes (outlined in Table 7) and be transparent in the trade-offs which may result through the implementation of strategies • identification and documentation of the residual risks – those which will remain even after the full plan is implemented • an outline of the community consultation undertaken to inform priorities • an implementation plan and specified review period • sufficient information to support a state-wide view on high priority actions.
Responsibilities	**Local governments:** • lead FRMP development in collaboration with local community and stakeholders. **QRA:** • provide state overview of high priority actions, as informed by local governments.

Communicate and consult

Develop information to aid the understanding and strategic management of flood risk. Provide this information to key end users and decision makers in a format that suits their needs and is consistent with the level of flood risks. Consult with local community and stakeholder to inform the development of FRMS and FRMP. Inform the community and key groups on progress and outcomes of studies, and on management decisions.

Table 5 – Communicate and consult

Expectations	**Communication and consultation should be undertaken to:** • encourage use of consistent terminology and mapping standards through the provision of state guidelines • understand the community and key groups' priorities and values with regards to integrated catchment management • gather information on communities' suggestions for managing the risk of flooding to their area, and gauge their support for a range of potential options • engage with the community and key groups on progress and outcomes of studies, and on management decisions • provide information regarding flood risk and management, in accessible formats.
Responsibility	**Local governments:** • collaborate and consult with, and inform, local communities and stakeholders. **QRA:** • prepare supporting guidelines and tools. **QFES:** • prepare and roll out community engagement programs.

Monitor and review

Monitor and review to ensure the assumptions, methods, data sources, results and reasons for decisions are subject to regular checks. These checks also consider changes in our understanding of flooding, its impacts and its management, lessons learnt from flood events, and trends in changes of exposure or vulnerability.

Table 6 – Monitor and review

Expectations	**Monitoring and review activities should:** • include regular review periods for each completed stage of this Framework • include annual reporting on metrics identified throughout this Framework • enable continuous improvement in flood risk management through increased efforts in prevention and preparation activities.
Responsibilities	**Local governments:** • determine appropriate review periods, and undertake reviews • monitor the progress of flood risk management in their areas • prepare a natural hazards, risk and resilience evaluation report which demonstrates compliance of the local planning instrument with those required and documented in the *State Planning Policy*. **QRA:** • produce annual update to QRCC on progress, informed by data provided by identified stakeholders. **QFES:** • ensure risk assessments and risk management strategies remain current and effective.

Flood risk management outcomes

Tables 1 to 6 outline the **process** of flood risk management, whilst Table 7 below details the **outcomes** sought to be achieved through the implementation of a range of possible management measures, many of which directly link to commitments made in the *Queensland Strategy for Disaster Resilience* (2017).

Table 7 – Flood risk management outcomes

Flood Risk Management Measure and QSDR Commitments	Expected outcomes	Responsibilities
Land use planning *Promoting the incorporation of risk reduction in all planning and development (QSDR, 2017)*	• Risk-based approach consistent with the *State Planning Policy*, which aligns flood hazard with appropriate land uses. • Planning schemes avoid future development in the flood hazard area, or the risk to people and property associated with future development in a flood hazard area is mitigated to an acceptable or tolerable level. • The potential costs and impacts of development in a floodplain is understood and communicated to state and local the relevant community as part of proposing a planning scheme outcome to tolerate the risk, where the risk cannot reduced further. Climate change is incorporated in land use planning decisions, both in terms of opportunities to support mitigation and adaptation. • Land use planning looks to avoid unacceptable existing risk through land use transition policies, where mitigation options are not viable.	**State lead:** **DSDILGP** – oversees the framework local governments use when making or amending planning schemes (with technical input consistent with systems established by DRDMW). **DSDILGP** – provides policy advice to assist local government on delivering state policy outcomes in planning schemes. **Local governments:** responsible for land use planning and development outcomes and making or amending planning schemes that incorporate flood risk mitigation considerations.

Emergency management *Promoting the incorporation of risk reduction in all planning and development (QSDR, 2017)*	• FRMS produce information which can be directly used by emergency responders and disaster managers, across all phases of prevention, preparedness, response and recovery (PPRR). • Costs and benefits of options are assessed with direct consideration of impacts on emergency response and operations. • FRMS review minor, moderate and major classifications for all gauges in study area as standard practice. • Flood intelligence systems are established and maintained. • Flood intelligence and emergency and disaster management plans are reviewed after flood events and significant changes in the catchment, and following the completion of new studies, so that plans can be improved. • FRMS develop databases of at-risk assets, shared with QFES and local governments.	**State lead: QFES** – through the implementation of the QERMF. Implemented by local governments.
Community engagement *Driving attitudinal change and behavioural change across the state, enabling Queenslanders to anticipate, respond and adapt to disaster impacts (QSDR, 2017)* *Providing opportunities for community-based solutions to the impact of disasters (QSDR, 2017)* *Increasing community awareness and preparedness for all hazards through community engagement (QSDR, 2017)*	• Community contributes to the development of the FRMS through active consultation and representation on flood management committee (or equivalent). • Information produced is accessible, useful and understood by a wide range of audiences and users. • Local governments provide information to support their communities through each stage of prepare-prevent-respond-recover phases (supported through Get Ready Queensland resources). • The best available information on flood risk is openly, transparently and inclusively available. It promotes community flood resilience and support informed decision making. • Use of consistent terminology and mapped standards. • Responsibility of the local community and individuals to inform themselves about their flood risks is highlighted.	**State leads: QRA and QFES –** promoting community awareness and resilience through an online resilience hub, prepare and rollout community engagement programs. Implemented by local governments.

Structural mitigation and infrastructure *Delivering more resilient infrastructure and transport systems (QSDR, 2017)*	• Structural mitigation measures are used to manage areas of existing flood risk where no other options are shown to be viable. • Structural mitigation measures are implemented with corresponding land use planning controls so as not to facilitate inappropriate future development. • Structural mitigation measures are assessed for their ability to function under future climate and population scenarios. • Funding for the implementation of any new structural mitigation measures are through partnerships, with costs shared amongst beneficiaries of the scheme. • New infrastructure, including transport infrastructure, considers the impact on potential flooding and opportunities to reduce risk to existing communities. • Options to better utilise existing infrastructure, including transport infrastructure, for flood risk management purposes are actively explored.	**State leads for structural mitigation measures:** • **DRDMW** - regulation of dams, flood storages and Category 3 levees. • **Local governments, Seqwater, Sunwater, DSDILGP** - construction and operation of new and existing flood mitigation infrastructure. • **DRDMW** - urban water security planning expertise. • **DRDMW** - advice when requested on floodplain management and in particular for prescribed flood mitigation dams and Category 3 levees. **State or local government leads for transport infrastructure:** • **Local governments, DTMR, Queensland Rail, port authorities** - as appropriate. Planning and implementation by appropriate entity.
Future scenarios *Understanding the risks associated with warming climate with improved coastal management (QSDR, 2017)* *Identifying adaptation opportunities following disasters and in anticipation of climate change (QSDR, 2017)*	• Flood risk profile is understood for both current and future conditions. • Future conditions include population growth and climate change. • All options assessed for current and future conditions. • Options do not facilitate further development in high risk areas (existing or future). • Options are assessed for the ability to reduce greenhouse gas emissions (to support mitigation of climate change futures) and adaptation to a changing climate. • Land use planning schemes are based on flood mapping which include allowances for climate change.	**State leads:** • **DES** - provide climate projection data, including guidance to local governments on appropriate climate change scenarios at the start of planning studies and prior to preparing a Feasible Alternative Assessment Report. • **DSDILGP** - guidance to local governments on implementing climate change scenarios in planning schemes. • **QFES** - state lead for the incorporation of climate change and disaster risk (within the QERMF). Planning and implementation by local governments.

Land management *Understanding the risks associated with a warming climate with improved coastal management (QSDR, 2017)* *Supporting the ability of our natural assets to serve as protective buffers against disaster impacts (QSDR, 2017)* *Furthering the understanding of the natural landscapes to reduce the impacts and effects of floods and bushfires (QSDR, 2017)* *Building partnerships across community, industry, research organisations and government to improve the health of waterways and marine areas (QSDR, 2017)*	• Land management practices support flood risk management - making space for river, reconnecting waterways, revegetation and naturalisation. • All benefits are captured, including opportunities for flood risk management and climate change mitigation and/or adaptation. • Natural assets are recognised and used to mitigate the impacts and effects of floods.	**Resources** • advice on soils, including conservation and management • vegetation management advice and regulation • storage, maintenance and sharing of Resources' environmental and spatial data **DES** • advice and research on climate change • advice and research on wetlands • conservation advice and regulation • environmental pollution and contamination regulation **DRDMW** • levee advice and regulation • watercourse advice and regulation • water resource management and regulation **DSDILGP** • planning and development advice and regulation **Implemented by:** • local governments • natural resources management groups • river improvement trusts • regional organisations of councils.
Built form *Innovation in urban design for living with the impacts of floods and droughts (QSDR, 2017)*	• Voluntary house raising, voluntary house purchase and flood proofing retrofit schemes may be a viable option to mitigate flood impacts to acceptable levels. • Built form is consistent with identified flood hazard. • Impervious areas resulting from development are minimised as far as practicable.	**Lead: local governments** Supported by State agencies: DEPW, DSDILGP.
Insurance	• Premiums are reduced for property owners who reduce their building's vulnerability to flood impacts. • Premiums are reduced when mitigation measures are in place. • ICA DataGlobe has up-to-date flood information.	Implemented by ICA.
Delivering Value for Money	• Resilience/mitigation and risk reduction investment decisions are based on sound economic analysis which demonstrates a net benefit to society, using the *Framework for the Economic Assessment of Flood Management Projects* (2021).	**State lead: QRA** Implemented by all agencies and local governments.

Accountability

In the context of this Framework, accountability is the willingness and ability of the organisations identified to take responsibility for their actions and work to achieve the expectations and outcomes described.

The ability of organisations to take responsibility for their actions is linked to effective investment decision-making and the availability of resources.

In Queensland, funding for flood risk management projects comes from a number of funding streams, each with varying objectives, project requirements and delivery timescales. It is recognised that this can be confusing for those wishing to access financial support.

State funding programs and schemes that support flood risk management projects will:

- articulate priorities of funding programs based on achievement against vision
- prioritise investment supported by consistent, evidence-based assessments
- incentivise co-contributions from beneficiaries
- capture the full costs and benefits, through consistent economic assessments
- be transparent in the decisions and trade-offs of investment decisions.

Furthermore, the capacity to conduct the required flood risk management activities and make relevant decisions is contingent on the existence of accurate and actionable data and information, the knowledge of how to use that information for planning purposes.

As a means to measure our progress towards fostering the most disaster resilient communities in Australia, a range of metrics related to the expectations and outcomes will be developed, reviewed and updated progressively.

QRA will provide updates to the QRCC on progress of these metrics, informed by data and information provided by identified stakeholders.

Knowledge

Current and future generations of flood risk management professionals need the right skills, knowledge and resources to do what is required of them.

Knowledge has traditionally been fostered at the individual level, but it can also be created and shared within an organisation through training and coaching, or outside formal organisational settings through industry bodies or communities of practice.

Professional networks - building knowledge and skills at the individual level

Professional networks, such as peak industry bodies and communities of practice, support professional development and build capabilities through providing networking opportunities, training, seminars and conferences, and through sharing and/or publishing (technical) resources and facilitating awards, orations and scholarships.

Some relevant peak industry bodies and community groups include:

- **Floodplain Management Australia (FMA)** - Australia's leading network of flood professionals, representing their members' interests at state and Commonwealth government levels, promoting public awareness of flood issues, and providing professional development for floodplain managers.
- **National Committee on Water Engineering (NCWE)** - the peak representative body for Engineers Australia members with an interest in surface water hydrology, hydraulics, water quality, water sensitive urban design and water resources.
- **Planning Institute of Australia** (PIA) - Australia's national body representing planning and the planning profession, supporting education, communication and professional development.
- **Flood Community of Practice** - Professionals from a broad range of disciplines with any interest in flood and water management.
- **Environment Institute of Australian and New Zealand Inc (EIANZ)** - a not-for-profit, professional association that supports environmental practitioners and promotes independent and interdisciplinary discussion.
- **Engineers Australia's National Committee on Coastal and Ocean Engineering (NCCOE)** - specialised knowledge needed to ensure safe and ecologically sustainable development of our nearshore zone, vital ports and harbours and valuable offshore resources.

Relevant existing resources in managing flood risk include:

- **Queensland Disaster Management Training Framework** outlines training to be undertaken by Queensland disaster management stakeholders to support the effective performance of each identified role, in accordance with the *Disaster Management Act 2003*.
- **Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia** (Handbook 7) (AIDR, 2017).
- **Australian Rainfall and Runoff** (ARR) is a national guideline document, data and software suite that can be used for the estimation of design flood characteristics in Australia.
- **Flood Classifications in Queensland** (June 2020) is a best practice guide to assist local governments to understand: flood classifications, river heights and flood forecasts, different types of gauges, flood warning based on a river height, how to determine and set flood classifications, and considerations when reviewing flood classifications.
- **Guide for Flood Studies and Mapping in Queensland** (former Department of Natural Resources and Mines (DNRM), 2017) - seeks to assist flood practitioners in Queensland create fit-for-purpose flood studies and mapping which encompass best-practice principles. Application of the guide will promote a consistent approach to flood studies and mapping throughout the state.
- **Flood Mapping Implementation Kit** (DNRM, 2014) assists a broad range of stakeholders more effectively implement the outcomes of flood studies. It aims to increase the use of flood mapping outputs, improving the community's understanding of their exposure to flood risk, and strengthening economic and community resilience.
- **Natural hazards, risks and resilience – Flood** (July 2017) has been prepared to support the implementation of the *State Planning Policy* and the interpretation of the natural hazards, risk and resilience state interest, focussed on flooding.
- **Flood Resilient Building Guidance for Queensland Homes** (April 2019) provides information about resilient design and construction options for new and existing homes flood resilient building materials, and systems and economic benefits of flood resilient design solutions.

- **Climate Change Adaptation Guidelines in Coastal Management and Planning:** Examines possible climate change scenarios affecting coastal engineering and provides guidance to coastal engineers, coastal managers and planners in responding to the challenges of our changing climate.
- **Queensland Climate Change and Community Vulnerability to Tropical Cyclones, Ocean Hazards Assessment Stage 1:** provides a review of technical requirements to undertake storm tide studies, including climate change.
- **A guide to 'good practice' storm inundation mapping and modelling** (DES, 2018): aims to provide assistance to local governments and others involved in coastal inundation modelling and mapping for the Queensland coast.
- **Coastal hazard technical guide, Determining coastal hazard areas** (former Department of Environment and Heritage Protection): This guide provides information about coastal hazards (storm-tide inundation and coastal erosion), and guidance for determining areas at risk from coastal hazards, including future risks linked to projected sea level rise and an increase in cyclone intensity.
- **Flood Communication Toolkit** (July 2020 - available to councils through the Get Ready Council Hub) provides flood messaging for councils and relevant state agencies to use in social media and other communication to improve community awareness and resilience to floods for all Queenslanders.
- **Building Resilience to Natural Disasters - Collaboration Guide** (February 2020) provides guidance on how to establish collaborative groups across stakeholders to advance locally-led resilience. It draws on some theory, and links activities to Queensland's disaster resilience policy framework.
- Educational videos on understanding flood risk: **https://www.qra.qld.gov.au/understand-your-flood-risk**
- Climate change science resources including a link to the Queensland Future Climate Dashboard can be found here: www.qld.gov.au/environment/climate/climate-change/resources/science

Another key aspect of supporting knowledge is effective arrangements for collecting, sharing and the dissemination of data. The capacity to conduct the required flood risk management activities and make relevant decisions is contingent on the existence of accurate and actionable data and information, along with the knowledge of how to use that data and information for planning purposes.

Appendix A: The legislative and policy landscape

Relevant legislation

Legislation dealing with flood risk management in Queensland covers issues ranging from planning and corporate responsibility to emergency response. The principal legislation is:

- *Queensland Reconstruction Authority Act (2011)*
- *Planning Act 2016 (Queensland)*
- *Disaster Management Act 2003 (Queensland)*
- *Building Act 1975 (Queensland)*
- *Local Government Act 2009 (Queensland)*
- *River Improvement Trust Act 1940 (Queensland)*.

Queensland Reconstruction Authority Act 2011

The *Queensland Reconstruction Authority Act 2011* (the QRA Act) establishes QRA as the state's lead agency for disaster recovery, resilience and mitigation policy. The main purpose of the QRA Act is to provide for appropriate measures:

- to ensure Queensland and its communities effectively and efficiently recover from the impacts of disaster events
- to improve the resilience of communities for potential disaster events.

With respect to flood risk management, two of the primary functions of QRA under the QRA Act include:

- to coordinate the development and implementation of whole-of-government policies for managing flood risks
- to facilitate mitigating against potential disasters, including the development of a network of flood warning gauges that complies with best practice.

Planning-related legislation

The *Planning Act 2016* (the Planning Act) establishes an efficient, effective, transparent, integrated, coordinated, and accountable system of land use planning, development assessment and related matters that facilitates the achievement of ecological sustainability.

A key feature of the planning legislation is the ability for a local government to prepare a Feasible Alternatives Assessment Report (FAAR). This allows local governments to make a planning change to reduce a flood risk which may constitute an adverse planning change as outlined under the Planning Act for which compensation may be sought from affected owners (i.e. down-zoning, changes to tables of assessment and hazard codes).

The Planning Act therefore includes specific provisions to allow a local government to make a decision where all feasible alternatives to making the planning change have been considered and exhausted. In these cases, a FAAR is to be prepared consistent with the Minister's Guidelines and Rules.

Completing the process and requirements has two effects:

1. the proposed planning change is no longer defined as an adverse planning change
2. compensation provisions available to an affected owner no longer apply relating to the extent of the planning change.

The preparation of a FAAR is intended to provide a clear and transparent process for local government's assessment of the proposed planning change, as it:

- demonstrates the reasoning for the proposed planning change by undertaking a risk assessment for the natural hazard and an assessment of feasible alternatives in accordance with any relevant Australian Standard or other relevant specifications
- will be publicly available through mandatory consultation where property owners will be notified and provided the opportunity to provide a formal submission.

This report would supplement the existing requirement for a local government to prepare a natural hazards, risk and resilience evaluation report which demonstrates compliance of the local planning instrument with the requirements of the State Planning Policy.

Disaster management-related legislation

In Queensland, the following key documents explain how disasters should be managed:

- *Disaster Management Act 2003 (Queensland)*
- *Emergency Management Assurance Framework*
- *State Disaster Management Plan*
- *Disaster Management Strategic Policy Framework*
- *Standard for Disaster Management in Queensland.*

Floods are one of the multiple hazards that local governments are required by law to manage in their local government area. Entities with roles or interests in local disaster management form a Local Disaster Management Group to assist each local government to coordinate its efforts. This group is in turn supported by District Disaster Management Groups and the State Disaster Management Group as per Queensland's disaster management arrangements.

The *Disaster Management Act 2003* (the DM Act) articulates disaster management stakeholders must be ready and equipped to help the community prevent, prepare, respond to and recover from both natural and man-made disasters. This applies to flooding in Queensland. A *Prevention, Preparedness, Response and Recovery Disaster Management Guideline* has been developed to provide guidance to local, district and state disaster management stakeholders with regard to their functions, obligations and legislative requirements under the DM Act.

Within Queensland's disaster management arrangements, local governments – through their respective Local Disaster Management Groups – have primary responsibility to manage a disaster at the community level. Accordingly, they are responsible for the development and implementation of their Local Disaster Management Plan.

Building-related legislation

The *Building Act 1975* (the Building Act) regulates building development approvals, building work, building classification, building certifiers and pool safety inspectors.

The Building Act dictates that buildings must be constructed in accordance with the *Building Code of Australia* and, where Queensland-specific provisions are necessary, the *Queensland Development Code* (QDC).

The QDC includes Mandatory Part 3.5 - *Construction of buildings in flood hazard areas* (December 2013). This Part ensures that particular buildings located in flood hazard areas:

- resist flotation, collapse or significant permanent movement caused by flood water
- safeguard occupants and other people against illness or injury caused by flood water affecting buildings
- are protected from backflow
- have utilities that are protected from the effects of flood water.

This Part also ensures that a customer dedicated substation is designed or located so its ability to function effectively is not affected by flood water.

It is noted that this Part does not apply to a building located, or proposed to be located, on a lot that is subjected to storm surge and to significant mudslide or landslide caused by rainfall or runoff.

Application of this Part is reliant on a local government prescribing a Designated Flood Level for all or part of an area, under section 13 of the *Building Regulation 2006*.

Local Government Act 2009

The purpose of the *Local Government Act 2009* is to provide for:

- the way in which a local government is constituted and the nature and extent of its responsibilities and powers
- a system of local government in Queensland that is accountable, effective, efficient and sustainable.

River Improvement Trust Act 1940

The *River Improvement Trust Act 1940* provides for the responsible management of river catchment areas through:

- planning for and implementing measures that improve the protection, health and resilience of rivers and their catchments
- repairing, and preventing damage to, rivers and their catchments
- restoring natural resilience to flooding and cyclones in rivers and their catchments
- protection of water security
- improving water quality and river system function in rivers and their catchments.

A River Improvement Trust is a statutory body constituted under this Act which has the power to raise funds, enter land, occupy land, enter into contracts and carry out works related to these objectives.

Related policies, projects and programs

This Framework is designed to provide clarity and guidance with regards to flood risk management in Queensland. It supports the implementation and guidance provided by a wide range of other initiatives, and seeks to inform a consolidated approach to achieving our aim of becoming the most disaster resilient state in Australia.

The Framework is developed with links to local, regional, national and international efforts to sustainably manage flood risk, the most relevant of which are discussed below.

The Framework builds on and replaces the *Strategic Policy Framework for Riverine Flood Risk Management and Community Resilience 2017*. The Framework aligns with the *National Strategy for Disaster Resilience* (2011), the *Queensland Strategy for Disaster Resilience* (2017), and has been developed consistent with the principles of the *Queensland Emergency Risk Management Framework* (2017) (QERMF).

In 2015, the *Sendai Framework for Disaster Risk Reduction 2015–2030* (the Sendai Framework) was adopted by Australia and other members of the United Nations. The Sendai Framework outlines four global priorities to support countries' efforts in strengthening disaster resilience:

- understanding disaster risk
- strengthening disaster risk governance to manage disaster risk
- investing in disaster risk reduction for resilience and enhancing disaster preparedness for effective response
- to 'Build Back Better' in recovery, rehabilitation and reconstruction.

The *Paris Agreement* and the *2030 Agenda for Sustainable Development* (including the Sustainable Development Goals (SDGs)) were also agreed on in 2015. Both agreements highlight the importance of climate change adaptation and disaster risk reduction. The United Nations Office for Disaster Risk Reduction recognises that progress in implementing the Sendai Framework supports the global community in meeting the SDGs.

Further, the *Ulaanbaatar Declaration of the Asian Ministers for Disaster Risk Reduction* (July 2018) calls for greater accountability of disaster losses, and alignment of disaster risk reduction and SDGs. It states a commitment to translating coherence of global frameworks into policy and practice to achieve resilience at national and local levels across all sectors, including by strengthening governance arrangements and by providing practical guidance to ensure effective and efficient management of disaster risk.

These international frameworks set the agenda for the development of key national and state policy frameworks, programs and projects, some of which are summarised below.

National Strategy for Disaster Resilience (NSDR), 2011

In response to a number of large scale, devastating natural disasters, the Australia Government released the NSDR to support the development of disaster resilient communities, recognising the shared responsibility and behavioural changes required to achieve this. NSDR defines resilient communities, high level roles, and the actions and outcomes required to achieve widespread disaster resilience.

National Disaster Risk Reduction Framework (NDRRF), 2018

The NDRRF guides national, whole-of-society efforts to proactively reduce disaster risk in order to minimise the loss and suffering caused by disasters. It is designed to leverage the work and progress made across all sectors since the release of the NSDR to better understand and reduce disaster risks, improve resilience, and bolster the capability and capacity of communities to withstand natural hazards.

Guidance for Strategic Decisions on Climate and Disaster Risk, 2019

The National Resilience Taskforce developed a set of interconnected guidance documents (Governance, Vulnerability, Scenarios and Prioritisation) to support implementation of the NDRRF. The guidance supports decision makers to contextualise the systemic impacts of a changing climate, to be used to inform strategic long-term planning and investment decisions. Whilst targeted at large-scale investment and high stakes decisions, it is considered adaptable to smaller-scale investments and disaster risk assessments.

Queensland Strategy for Disaster Resilience (QSDR), 2017

The QSDR sets strategic direction for the realisation of the Queensland Government's vision to make Queensland the most disaster resilient state in Australia. Through the QSDR, the Queensland Government will harness the capabilities of its agencies, informed by the experience and knowledge of local governments, communities and individuals, to further build the state's capacity for resilience against all hazards. The QSDR provides an overarching framework to Anticipate, Respond and Adapt with four key objectives - Queenslanders understand their disaster risk; strengthened disaster risk management; Queenslanders are invested in disaster risk reduction; continuous improvement in disaster preparedness, response and recovery.

Queensland Emergency Risk Management Framework (QERMF), 2017

The QERMF establishes Queensland's approach to disaster risk management. It provides a risk assessment methodology that can be used within disaster management planning at all levels of Queensland's disaster management arrangements. The process applies a standardised and internationally recognised approach to the prioritisation, mitigation and management of risk. This includes the consistent identification and passage of residual risk between levels of Queensland's disaster management arrangements to directly inform planning and resource allocation and to promote active communication, cooperation and coordination.

Queensland Disaster Management Data Coordination Initiative (QDMDCI)

The QDMDCI is a QFES-led initiative to improve disaster management data coordination activities across all disaster management groups, including all levels of government, non-government organisations and private entities with the aim of improving Queenslanders' ability to better plan, manage and respond to disaster events.

Queensland Disaster Resilience and Mitigation Investment Framework, 2019

QRA developed this Framework to act as the link between policy, funding sources, guidelines and investment and procurement approaches, to support the alignment of funding programs in Queensland's resilience priorities. It provides guidance to public sector agencies to determine investment prioritisation for specific funding programs, based on the consideration of the prioritisation approach, assessment criteria and measuring success.

State Planning Policy (SPP), 2017 and associated SPP State interest guidance material.

The Queensland Government established the SPP to define the matters of state interest in land-use planning and development. State interest in the SPP consists of a state interest statement, state interest policies and, where applicable, assessment benchmarks.

The guidance material provides support for implementation of the SPP with respect to flood hazards, through a risk based assessment, and is particularly focused on (although not mandatory) assisting local governments when making or amending a local planning instrument and when applying the assessment benchmarks. The SPP guidance material is intended to be read in conjunction with the SPP and is not statutory in its effect, nor does it contain any new policy requirements.

Queensland Climate Adaptation Strategy (QCAS), 2017–2030

The QCAS sets a framework for managing risks and maximising opportunities resulting from a changing climate. It includes four pathways of action, described as People and Knowledge, State Government, Local Government and Regions, and Sector and Systems.

Flood Warning Infrastructure Network (FWIN), ongoing

The FWIN is an ongoing program of works lead by QRA, in close collaboration with key stakeholders, including the Bureau of Meteorology and local governments, to improve Queensland's flood warning infrastructure. Comprising more than 3000 rainfall and river gauges across the state, owned and operated by multiple entities, both private and varying levels of government, the FWIN aims to identify priority locations requiring additional infrastructure capability through a locally-led, regionally coordinated, catchment approach.

Economic Assessment of Flood Risk Management Projects, 2021

The economic assessment framework for flood risk management projects supports the NSDR and QSDR through ensuring consistent and comprehensive economic assessment to support decision making, particularly with regards to investment in flood risk management.

Prevention Preparedness, Response and Recovery Disaster Management Guideline, 2018

This Guideline has been developed to provide guidance to local, district and state disaster management stakeholders with regard to their functions, obligations and legislative requirements under the *Disaster Management Act 2003*. It outlines a comprehensive end-to-end process for the steps to be undertaken through each of the phases of disaster management, specifically addressing roles and responsibilities of disaster management stakeholders, prevention and mitigation strategies, preparedness arrangements and considerations for planning, the activation of response arrangements, the recovery process and financial arrangements.

Appendix B: List of abbreviations

DEPW	Department of Energy and Public Works
DES	Department of Environment and Science
DNRM	(former) Department of Natural Resources and Mines
DRDMW	Department of Regional Development, Manufacturing and Water
DSDILGP	Department of State Development, Infrastructure, Local Government and Planning
DSDSATSIP	Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships
DTMR	Department of Transport and Main Roads
EIS	Environmental Impact Statement
FAAR	Feasible Alternatives Assessment Report
FRMP	Flood Risk Management Plan
FRMS	Flood Risk Management Study
FWIN	Flood Warning Infrastructure Network
Handbook 7	Managing the Floodplain: A Guide to Best Practice In Flood Risk Management in Australia, 2017
ICA	Insurance Council of Australia
NDRRF	National Disaster Risk Reduction Framework, 2018
NSDR	National Strategy for Disaster Resilience, 20111
OCG	Office of the Coordinator-General
QCAS	Queensland Climate Adaptation Strategy, 2017 - 2030
QERMF	Queensland Emergency Risk Management Framework, 2017
QFES	Queensland Fire and Emergency Services
QRA	Queensland Reconstruction Authority
QRA Act	Queensland Reconstruction Authority Act 2011, version current as at 11 April 2019
QRCC	Queensland Resilience Coordination Committee
QSDR	Queensland Strategy for Disaster Resilience, 2017
RQ	Resilient Queensland, 2018
SDG	Sustainable Development Goals
SPP	State Planning Policy, 2017
SPP Floods	State Planning Policy, state interest guidance material: Natural hazards, risk and resilience – Flood, 2017

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