SETTING REGIONAL FLOODPLAIN MANAGEMENT PRIORITIES IN VICTORIA

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Introduction

Victorian Catchment Management Authorities (CMAs) have developed Regional Floodplain Management Strategies (RFMSs) using a structured and standardised methodology, making it possible to evaluate risks equitably and set mitigation priorities consistently across Victoria. Each RFMS was developed in partnership with relevant agencies and communities.

This approach represents a transition from the reactive approaches of the recent past to a strategic approach to floodplain management based on a risk assessment framework.

Formally, each RFMS sought to:

- Identify those parts of the region with significant flood risk;
- Identify possible actions to mitigate those risks; and
- Establish a Regional Work Plan of priority actions to be implemented over the 10 year duration of the Strategies.

Various informal goals were also achieved through the development of RFMSs, including:

- Establishing and improving relationships with Local Government Authorities (LGAs), government agencies, water corporations and at-risk communities (to name a few);
- Improved understanding among stakeholders of the policies, accountabilities and actions from the new Victorian Floodplain Management Strategy 2016 (VFMS); and
- Provided an opportunity for an on-ground review of the 2016 floods that occurred in various parts of Victoria, and determining if processes had improved from the learnings from the 2010-11, floods or where additional work was still required.

This paper provides two case examples of the development of RFMSs within two Victorian CMA regions, the North Central CMA region and the West Gippsland CMA region.
Background

The widespread Victorian floods of 2010-12 revealed institutional weaknesses in the management of flood warning systems and flood mitigation infrastructure. The *Review of the 2010-11 Flood Warnings & Response* (Comrie, 2011) and the *Inquiry into Flood Management Infrastructure in Victoria* (Environment and Natural Resources Committee, 2012) enabled the Victorian Government to take action to ensure Victoria is better protected into the future. These actions included the development of the 2016 *Victorian Floodplain Management Strategy* (Department of Environment, Land, Water and Planning, 2016).

The VFMS addressed several challenges around institutional arrangements in relation to flooding, by clarifying such arrangements to ensure continual improvement in all aspects of floodplain management. Key challenges identified were the lack of clarity in flood warning arrangements; lack of governance over flood mitigation infrastructure; the need for communities to have more say in local floodplain management; improved land-use planning; and better public access to high-quality flood mapping and information. The VFMS was developed with input from key stakeholders in floodplain management and the broader Victorian community.

The objectives of the VFMS are to:

1. Encourage communities to act responsibly to manage their own risk;
2. Reduce legacy issues to minimise exposure to future flood risk and consequences;
3. Not make things worse; and
4. Provide support to emergency services by focusing on prevention activities.

Moderate flooding in parts of Victoria in late 2016 provided a small test of changes to emergency response and coordination between agencies, while reiterating the need for further action in other areas.

A key action of the VFMS required CMAs to develop and periodically review Regional Floodplain Management Strategies in partnership with Local Government Authorities (LGAs), the Victorian State Emergency Service (VICSES), regional agencies and local communities. Each RFMS aims to provide a single, regional planning document for floodplain management including a high-level regional work plan to guide future investment priorities.

RFMSs were developed by CMAs throughout 2016 and 2017, documenting the actions required within each region. Guidance material was developed through the establishment and regular convening of a group of officers leading strategy development at their respective CMAs. Adopting consistent methodologies at the regional level makes it possible to compare risks and costs of projects equitably and therefore set mitigation priorities at the state level. The Strategies are regional documents that have been jointly prepared and will be implemented by all relevant agencies.
Regional Floodplain Management Strategy development overview

The objectives of each Regional Floodplain Management Strategies (RFMS), based on those at the state level, are:

1. Build a flood-resilient community;
2. Reduce existing flood risks;
3. Avoid future flood risks; and

The process of developing each RFMS involved:

- Assessing flood risk across the region against the community’s tolerance to the risk;
- Exploring mitigation measures for those risks considered intolerable;
- Prioritising actions to be achieved over the term of the Strategies, subject to feasibility and available resources; and
- Establishing a monitoring and evaluation framework to determine the success of implementing the Strategies.

Each region was divided into logical sub-areas and a consistent ‘Rapid Appraisal Methodology’ was applied, allowing for communities with similar flood risks to be measured equitably. The risk assessment provided relative risk scores for an area based on annual average damages and the estimated population at risk.

The methodology considered known flood extents, planning zones, land use and coastal inundation. The nature of the rapid appraisal means it was unable to consider critical infrastructure, flood risk where flood hazard data was absent, future development areas, and community tolerance to flood risk. As a result, a second process involving consultation with local agencies was required to incorporate these factors and identify additional areas of significant flood risk.

Consultation played an overarching role in risk assessment and possible mitigation actions. Community input regarding flood risks and their impact was a key component in the assessment of flood risks and their priorities for mitigation actions. Some communities are aware of their flood risks and are satisfied existing treatments provided by agencies, or their own individual responses, are sufficient. Other communities are seeking actions to mitigate their risk and provided recommendations for consideration by the responsible agency/s.

Based on outcomes from the regional risk assessment and consultation with agencies and communities, a draft list of possible flood mitigation actions was developed. It was imperative no agency was tasked with an action that it was unwilling or unable to undertake. The availability of funding for such actions was an incentive, however agencies needed to assess their priorities and the priorities of their communities. The list was then further refined into final 10-year Regional Work Plans. Priority actions for mitigating floods identified in Regional Work Plans meet the following criteria:

i. The location has a significant risk relative to the region;
ii. The existing risk treatments are considered inadequate;
iii. Additional risk treatment(s) may reduce flood risk;
iv. Additional risk treatment(s) are financially, socially and environmentally feasible; and
v. Each responsible party considers the action achievable, subject to funding and resources, over the term of the Strategy.
Approaches to flood mitigation

Preventing flooding is extremely problematic and ineffective. Researchers argue that ‘there are many human uses consistent with periodic flooding, such as the growing of pasture and timber, but building infrastructure on floodplains is not one of them.’ (Humphries, McCasker, & Keller Kopf, 2016). In the past, flood mitigation relied heavily on channel modification and levee construction. Physical infrastructure options can protect floodplains to some extent but can never protect against all floods. Towards the end of the 20th century, it became apparent that these types of ‘hard’ flood mitigation methods are often expensive, have negative impacts on the environment and on flood behaviour, and create significant problems when they fail or are overtopped (Western, 2011).

It is now well recognised that the most effective flood mitigation options are of the ‘soft’ variety, including sound flood management planning, the creation of high quality flood mapping, timely and meaningful flood prediction services, detailed flood response plans with clear accountabilities, improved land use planning and improved community education.

Flood risk treatment options have been categorised in Victoria as:

1. Planning scheme controls
   Effective land-use planning seeks to ensure future development is compatible with potential flood risk, and is widely recognised as being more cost-effective than structural mitigation options.

2. Structural flood mitigation infrastructure
   Well-managed infrastructure such as levees provide benefits, but many of Victoria’s levees, particularly in rural areas, are not well managed or maintained, creating a risk of failure during a flood and contribute to unintended flood impacts. Any new structural flood mitigation infrastructure schemes in Victoria will be established with clear ownership and maintenance accountabilities.

3. Total Flood Warning System (TFWS) services
   TFWS services contain many elements vital to flood response and offer a higher level of service than broad Bureau of Meteorology warnings. They include networks of rainfall and stream gauges, information dissemination arrangements, community awareness programs, and planning and response arrangements.

4. Municipal Flood Emergency Plans (MFEPs)
   VICSES is responsible for the preparation of MFEPs in partnership with local governments. The plans identify communities and assets at risk and advise on how to prepare for, respond to, and recover from flood events.

Resolving legacy issues around ‘hard’ flood mitigation is a consistent theme across Victoria, however, the development of RFMSs has also seen a larger than traditional focus on ‘soft’ flood mitigation approaches for reducing identified risks and increasing community resilience.

The following sections provide two case examples of the development of RFMSs within two Victorian CMA regions, the North Central CMA region and the West Gippsland CMA region.
The North Central Strategy

The North Central CMA region covers thirteen per cent of Victoria’s land area and encompasses a diverse range of land types, from the foothill forests of the Great Dividing Range to the riverine plains of the north. The region has four major river catchments – the Campaspe, Loddon, Avoca and Avon-Richardson (see Figure 1 on page 7). The catchments extend across 14 different LGAs.

The region supports many significant and important natural assets, ranging from internationally recognised wetlands such as the Gunbower Forest to the complex ecosystems of the river floodplains, which support a diversity of native flora and fauna.

Economically, the region supports a range of industries, but the predominant land use is agriculture, with extensive areas of irrigation in the north, productive cropping and mixed farming in the west, and cropping and grazing country in the mid and upper catchments.

The region’s population is roughly 250,000, with continuing population growth expected in urban areas such as Bendigo, Castlemaine, Kyneton and Echuca.

More than 780,000 hectares of rural and urban land across the region under public and private ownership is estimated to be subject to inundation by a 1% Annual Exceedance Probability flood (i.e. a 1-in-100 year average recurrence interval).

Early river regulation, including river gauging stations, has provided a long history of recorded floods during the region’s European occupation, with gauge records as far back as the 1890s for floods on the Loddon River. Major and widespread floods were recorded in 1909, 1916-17, 1923, 1933, 1956, 1973-76, 1983, 1988, 1993, 1998 and, more recently, during the summer of 2010-11 and again in February 2012 and September 2016.

The intensity and amount of rainfall that saturated areas of Victoria in 2010-11 resulted in the largest, or close to the largest, floods recorded on many of the state’s major river systems. The January 2011 flood was the largest on record for most river systems in the region, inundating an estimated 780,000 hectares (more than 25% of the region). Water storages and wetlands were filled, minimising opportunities to mitigate flood impacts. Some affected areas had not previously been identified as subject to flooding, while other places had been impacted multiple times. Significant areas of the Loddon and Avoca floodplains were impacted again by flooding in September and October 2016 during the development of the North Central Strategy, meaning flood stories and issues were fresh in the memory of communities consulted.
Figure 1  North Central Catchment Management Authority region

2018 Floodplain Management Australia National Conference
The North Central Strategy reviewed the performance of the region’s existing flood risk treatments (as categorised on page 5 above) based on the consistent methodologies developed by CMA practitioners. Where treatments were found to be insufficient, an action was proposed for improvement and incorporated into the Regional Work Plan. The following observations were made per risk treatment category:

- Planning scheme controls – a lack of high-quality mapping has been a long-standing issue across the region with planning controls being based on the best available information at the time, or on limited information at all. Conversely, where flood data has been available, there was a common theme throughout the region of a delay between the development of that mapping and its incorporation into local planning schemes for it to be effective in managing development outcomes.

- Structural flood mitigation infrastructure – the region has the highest concentration of levees in the state; there are hundreds of structural works that influence the movement of floodwaters throughout the region. While the essential township levees are well documented, the remainder of the levees, their function, and their governance arrangements are not. These need to be investigated and documented to provide a base case for future improvements – which may include managed removals.

- Total Flood Warning System services within the region were assessed for adequacy against the associated flood risk level and community feedback for respective sub-areas. In most locations, it was determined that the lack of high-quality flood mapping and the accessibility of that mapping to the relevant communities contributed to low community awareness and preparation, and limited community ability for effective response during flood events.

- Municipal Flood Emergency Plans were also lacking high-quality flood mapping for effective emergency management operations and community messaging. Some plans didn’t exist or were underdeveloped, while others had too much information to be effective operational plans and need to be reviewed.

A number of specific regional issues also arose through consultation that warranted discussion in the Strategy, to ensure the content within aligned with community expectations on what a North Central Region Strategy would include. This included conversation on:

- Flood flow distributions through the catchment. Private and sometimes illegal levees, neglected flood management schemes, irrigation modernisation, road upgrades and general misinformation have resulted in floodwaters flowing to locations that no longer align with community expectations;
- Similarly, coordinated management of residual floodwaters lingering in the landscape needs to align with community expectations to prevent illegal works (e.g. cutting of banks) and additional damage, and to avoid litigation between individuals and agencies;
- Illegal works within the catchment were a large focus in the region with concerns raised about the displacement of floodwaters, flooding in unexpected locations, and significant damages to housing, crops, livestock and fencing;
• Uncertainty about the ability to remove vegetation from waterways for floodplain management purposes and low understanding of general waterway management responsibilities;
• A lack of Traditional Owner involvement in floodplain management and flood emergency management;
• Significant and prolonged disruption to both local and major transport routes; and
• Concerns for the ability of the region’s LGAs to manage the risks and provide the services their communities expect of them, in areas where population densities range from 130 people per square kilometre (e.g. urban areas) to less than one person per square kilometre and almost a kilometre of road per ratepayer (Buloke Shire 2018 and Census 2016)

In response, The North Central Strategy identified seven Regional Priorities to reduce flood risk and increase flood resilience across the region. The seven priorities are:

1. Update planning controls to reflect the best available information
2. Construct new flood mitigation infrastructure, resolving ownership and maintenance accountabilities, and improving floodplain function
3. Address gaps in flood knowledge through flood mapping projects
4. Improve preparedness for flood emergencies
5. Educate agencies and individuals on the roles and responsibilities in floodplain management
6. Incorporate Traditional Owner knowledge into floodplain management
7. Create a flood-resilient transport network

Each of the regional priorities have sub-actions which contribute to the achievement of the priority, with almost 200 actions proposed to be undertaken over the next 10 years. A majority of the actions will be led by Victorian Local Government Authorities and State-based emergency management authorities, subject to available resourcing from Federal, State, and local government agencies.

A copy of the North Central Regional Floodplain Management Strategy can be found at www.nccma.vic.gov.au
The West Gippsland Strategy

The West Gippsland region covers an area of approximately 20,000 square kilometres including the marine environment. The region accounts for almost eight per cent of Victoria’s total land area and includes a broad range of bioregions, flora and fauna. Corner Inlet and the Gippsland Lakes are wetlands of international importance under the Ramsar convention. The upper catchments are generally steep and forested with lower reaches comprising wider floodplains including coastal inlets and lakes.

The region comprises three major sub catchments as shown in Figure 2 below which include 6 LGAs. Waterways in South Gippsland flow to more than 150km of coastline while the Latrobe and Thomson Rivers flow to Lake Wellington in the Gippsland Lakes.

Floods have been recorded in West Gippsland since the 1890s and can be caused by high rainfall and/or coastal storm surges. They can severely disrupt communities and the regional economy. In 1934, the Yallourn open cut coal mine was flooded when the Latrobe River burst its banks, and in 2011 flooding and landslides destroyed roads and bridges at Wilsons Promontory National Park, requiring the evacuation of campers by helicopter and months of rebuilding.
Large-scale floods occurred across the West Gippsland region in 2007 and 2012. In both cases, several river systems were in flood, resulting in flooding over an extensive area for a number of days. The 2007 flood, which had a lower peak level than a 1% Annual Exceedance Probability flood, caused widespread damage and was a significant burden on emergency services. VICSES personnel were deployed to the area from other parts of Victoria, which fortunately were not in flood at the same time (Molino Stewart, 2008).

The 2012 flood resulted from a severe weather event with heavy rainfall and widespread flooding across many municipalities. Its impact was made worse by the degree of rainfall and flooding experienced a few weeks earlier, which saturated catchments. Emergency services were also challenged by concurrent windstorms. In the later stages of this flood event, personnel from other regions in Victoria reinforced key functions in the local Incident Control Centre (ICC).

The West Gippsland coastline is vulnerable to coastal inundation during significantly high tides, particularly when in conjunction with storm surges. The severity of impacts varies depending on factors including geomorphology, estuary characteristics and population and infrastructure inundated. In addition, the impact of individual meteorological events on flooding can vary due to precedent conditions and the direction and severity of weather conditions. Assets including farmland, roads, boardwalks, life-saving towers, foreshores and jetties have been damaged by coastal inundation.

Future changes to the climate in West Gippsland are predicted to create hotter and drier conditions and an increase in severe weather events, including bushfires, storms, droughts and floods. Many steep and forested catchments in the region are likely to experience more severe flooding following bushfire and high-intensity rainfall events. Along the Gippsland coastline, the increase in frequency and intensity of storms is likely to interact with sea level rise, causing greater inundation and erosion.

Rural drainage issues in the area are complex due to legacy issues relating to works undertaken in the past and confusion around current roles and responsibilities. Rural drainage relates to the removal of local rainwater from rural land via systems such as drains and channels, which is dealt with separately from flooding of land from waterways where rainfall has fallen elsewhere in the catchment. Clarifying this distinction to landholders was often extremely difficult. Explaining to communities that the Strategy is confined to floodplain management and that rural drainage issues will be investigated under a state-wide drainage strategy frustrated landholders who were confused by accountabilities and concerned by long-term inaction.

The most significant rural drainage issues in the catchment occur along the Moe River which was straightened and channelised during the 1890s, with excavated material left at the top of the bank creating informal levee banks. As a result, rural drainage issues intersect with floodplain management, in some locations causing serious damage to the river banks and adjacent Council roads. Landowners were less concerned about the cause of the damage or which government agency is responsible, than they were about having the problems resolved. The Strategy has recommended that formal management of the drainage area along with some structural works along the river be investigated.

The risk assessment identified many urban areas with a significant flood risk, predominantly from riverine inundation with a small number from coastal inundation only. In addition, large areas of rural land have a significant flood risk due to low-lying farmland with the potential for costly damage to crops and infrastructure, and loss of livestock.
The provision of flood-risk treatments in West Gippsland has been tailored to the flood risk in a location, and it was not expected that all areas would have all treatments applied. Some communities accept their flood risk and are satisfied with current risk treatments, which is one reason why consultation with communities, LGAs and VICSES was vital. It was determined that communities in West Gippsland are generally well serviced by existing flood risk treatments, however, a range of actions were identified to further reduce flood risks across the region.

The following specific issues were identified through the process of reviewing existing flood risk treatments in the region:

- **Planning scheme controls** – similar to the North Central region, flood mapping in planning schemes across West Gippsland is often outdated, leading to potentially inappropriate development in areas with a flood risk. Undertaking flood modelling and developing flood mapping requires time and resources and is an ongoing process. Updating planning schemes to include the data is the responsibility of each LGA but is hampered by their resourcing and budgets and requires a lengthy process, often resulting in a Planning Panels Victoria hearing.

- **Structural flood mitigation infrastructure** – there are many levees and regulating structures across the region, but most are undocumented and not managed or maintained. There is confusion around responsibilities in relation to infrastructure.

- **Total Flood Warning System services** – as with the North Central Strategy, current services were assessed against flood risk and community expectations to determine where TFWSs should be improved. Due to the large areas and low population densities involved in much of the region, submissions to install additional monitoring gauges to provide better prediction services were not considered feasible in most cases, though some existing gauges could be connected to telemetry. Improving flood mapping and making it available to communities is considered to provide the most benefit.

- **Municipal Flood Emergency Plans** – current flood mapping and interpretive information in MFEPs is generally restricted to larger urban areas. Several areas with significant flood risk have no flood guide or one that includes outdated mapping. Development or revision of MFEPs and local flood guides is dependent on VICSES resources and LGA support, and has been limited to two flood guides per year in West Gippsland.

A number of other issues were identified, including:

- An overall lack of understanding of governance arrangements and responsibilities in relation to several areas including waterway management, undertaking flood studies, management of infrastructure and the impact of private works on nearby properties. Clarification has been provided in the VFMS however there is some difficulty in communicating the information and having it accepted, particularly where parties see it is cost-shifting;

- Management of vegetation and silt in waterways contributes to flooding in some areas. In the past, the WGCMA has undertaken works to address these issues, however the VFMS clarified that it is not a CMA responsibility and no funding is provided to CMAs for this purpose;
• Significant disruption to major transport routes and local / regional economies caused by flooding and a number of key rural roads that regularly flood with no warning systems in place;
• Concerns around resources available to LGAs in light of recent State-legislated local government rate capping and the VFMS clarifying that they are accountable for some activities that they have not been previously undertaking (such as flood studies), causing a delay in the implementation of LGA actions; and
• Despite the funding available from Federal and State Governments for implementation of actions identified in the RFMSs, responsible agencies are still expected to fund one third of the cost, which is prohibitive in some cases.

In response, the West Gippsland Strategy identified the following actions to reduce flood risk and increase flood resilience across the region:

• Update the planning schemes to include updated flood mapping where available;
• Scope the development of a community flood portal to disseminate information about flooding, with a focus on areas without a flood warning system;
• Investigate the installation of warning systems for VicRoads roads that are subject to significant inundation as identified by LGAs and VICSES;
• Ensure ongoing management of features such as waterways, levees and retarding basins where historic poor management contributes to flood risk;
• Undertake flood studies and develop detailed flood maps for areas without current flood mapping and integrate them with flood education products and programs;
• Make current flood mapping available to Traditional Owner groups and investigate the development of historical flood mapping to assist them in identifying their Cultural Heritage sites at risk of flooding;
• Ensure that flood mapping, intelligence and local knowledge in MFEPs is regularly reviewed and updated; and
• Develop individual flood guides for high priority areas.

Key challenges in developing RFMSs

There were a number of common challenges encountered in the development of the RFMS in both the North Central and West Gippsland region, which will be outlined in this section.

Effective Traditional Owner engagement

Aboriginal Australians have strong connections to Country with many sites of cultural heritage significance across both regions, particularly around floodplains and waterways. There are seven Traditional Owner (TO) groups across the North Central region and four across West Gippsland, all with varying degrees of formal recognition (such as Recognised Aboriginal Parties [RAPs]) and organisational capacity. Their involvement was considered important in order to further develop partnerships and increase CMA’s understanding of TO values, needs and aspirations in relation to floodplain management.

Engagement attempts in both regions were largely unsuccessful, with the exception of two groups in West Gippsland which are both RAPs. Both groups considered that access to current flood mapping and the development of historical flood mapping (pre-European occupation) would assist them to identify flood risks to cultural heritage sites and therefore actions have been proposed in the West Gippsland Strategy to address this.

The engagement process reiterated the issue that TO involvement in modern floodplain management and flood emergency management is not well developed. Therefore, actions within each strategy were kept at a high-level, reflecting the need to begin the integration of TO involvement and knowledge into modern floodplain management and flood emergency management practice.

Effective community engagement

Generally, an interest in flooding issues is restricted to those who have been impacted by it, and community engagement often involves the same groups and individuals over a number of projects. Community sessions can be poorly attended or hijacked by a vocal minority.

North Central CMA hosted seventeen community sessions and found they attracted the same people as previous forums, with issues that had been previously identified – but not yet resolved. WGCMA opted to seek feedback via submissions rather than at face-to-face meetings, and also found that most submitters had been previously engaged about their issues. A positive aspect of this was that the RFMS provided an effective way to capture these long-standing community issues and provide the community with confidence that actions within the strategies will address their concerns and not be lost over time or due to key staff moving on.

Interest in the strategies from those not recently impacted by flooding was disappointingly low in both regions, even though risk assessments suggested such areas may be likely to flood in the future. In addition, both CMAs found that the demographic of those engaged (whilst not explicitly recorded) and responses received demonstrated a lack of representation from youth, full-time workers and stay-at-home parents – although this was not unexpected.
Conversely, flooding in September and October 2016 within the North Central CMA region provided benefits to the consultation process, identifying new and emerging issues and prompting feedback about the effectiveness of recent changes compared to management of the 2010-11 floods, as well as reiterating where future improvements are still required.

Acknowledging the shortfalls of some engagement activities and ensuring all local issues were captured in the development of the strategies, intensive engagement sessions occurred with both local government and VICSES representatives. These officers often live in the area, hear the common concerns of residents and are usually ‘on the ground’ during flood responses. Therefore, intensive effort was applied to gather as much knowledge from them as possible in developing actions for Regional Work Plans.

**Education on roles and responsibilities**

Development of the RFMS was an educational process in relaying the policies, accountabilities and actions from the new VFMS released in April 2016, to LGAs, State-based agencies and communities. While many things aligned with traditional practice, there were multiple changes in policies and determinations of accountabilities. This required a learning process throughout the delivery of the RFMS content to stakeholder working groups and when designating actions within Regional Work Plans.

Two particular points of contention included who should lead new flood studies and who could undertake waterway maintenance.

1. Flood studies have often been done by CMAs in the past and some LGAs are anxious about their lack of technical knowledge and internal resourcing to complete such projects. The VFMS preference is that CMAs provide technical support (for example in preparing project briefs, reviewing proposals and analysing hydrologic and hydraulic modelling), however Council is nominated as the project manager. This arrangement aligns with Councils’ responsibilities for many of the outcomes of flood studies including TFWS upgrades, urban levee management, urban waterway management and updating planning schemes.

2. Waterway management has traditionally been an action also undertaken broadly by CMAs. But as funding has declined, CMAs have moved to asset-based protection approaches rather than broad-scale waterway management, leaving a legacy of expectation but with no dedicated funding or proposed future action. Compounding the decline of CMA involvement, it was not broadly known by LGAs and other State-based agencies that they are also enabled to undertake waterway management works where there are threats to their interests. This has been an education process since the floods of 2010-11. Promisingly, actions arising from the VFMS now allow for community members to undertake waterway management works where they can determine the benefits of doing so, via permitting processes through CMAs.
Local Government Authority capacity to fund and deliver projects

Despite the funding available from Federal and State Governments for implementation of actions identified in the RFMSs, responsible agencies are still expected to contribute to one third of the cost. In addition, resources are required to manage projects or engage consultants. Many rural LGAs are under-resourced and have limited ability to raise revenue to invest in new flood studies, new flood mitigation infrastructure and/or new community services. It cannot necessarily be expected that all high-priority actions be addressed in the first three years of implementation, if the cumulative cost is outside the lead agency’s means.

With that in mind, the strategies have been developed in partnership with LGAs to realistically account for their capacity to address flood risk within their administrative boundaries. This is reflected in the priority, cost and timeframe of each action in Regional Work Plans.

Strategy implementation

Implementation of each RFMS will be guided by an Implementation Committee which includes members from each agency with responsibilities or actions in Regional Work Plans. Engagement with relevant stakeholders, including impacted communities, will continue as individual actions in Regional Work Plans are implemented.

Funding for priority works identified in Regional Work Plans will be subject to a three-way cost-sharing arrangement between the Federal Government, State Government and Local Government (or other responsible agencies). Eligible projects must meet the State Government’s investment criteria in that they must be subject to due process and due diligence, they must be cost effective, be supported by economic analysis and have community benefits (Department of Environment, Land, Water and Planning, 2016). Prioritisation is subject to change as implementation of the strategies progress.

Key challenges to implementation

Implementation of the strategies will face many of the same challenges that arose during their development, given the long-term processes involved in engaging with communities and agencies, improving understanding around roles and responsibilities and the ongoing concerns about resourcing.

Changes to agency staff over time often risks losing the knowledge, understanding and relationships that were built during development of the strategies, requiring ongoing and frequent effort to maintain relationships (and rebuild when necessary), to ensure the implementation of strategy actions over time. However, it is recognised that changes to personnel over time can also provide the opportunity for new perspectives and approaches to implementation, providing an overall benefit to the floodplain management community of practice.

Communities will continue to be engaged where they are impacted by proposed actions, however it is also likely that future flood events will provide opportunities for wider engagement and help guide the implementation as priorities change.

Overall, the recent challenges are likely to persist and new challenges may arise, therefore effective implementation will require flexibility and understanding by all stakeholders to overcome these challenges and continue to deliver benefits to the community.
References


