



Queensland Floods Commission of Inquiry
PO Box 1738
Brisbane QLD 4001

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Email: info@floodcommission.qld.gov.au

Re: Submission to the Flood Inquiry

1. Introduction:

Recent events have shown that Queensland is highly vulnerable to natural disasters, which will only increase as climate change further affects weather patterns and produce more frequent and severe weather events.

However, in spite of this substantial vulnerability, it is clearly evident that Queensland is not taking adequate steps to manage the increasing risks associated with the likelihood of more frequent and severe future weather events.

For example, greenhouse gas (GHG) emissions are acknowledged as one of the primary causes of climate change, yet little is being done to reduce Queensland's per capita GHG emissions which are recognised as being the highest across the nation. Furthermore, urban and other vulnerable development is still occurring on floodplains and natural flood mitigation features such as mangroves, wetlands and riparian areas continue to be degraded under current planning and regulatory frameworks, which again significantly increases our vulnerability to future severe weather events. Consequently, no other state is contributing as effectively to its own risk and vulnerability to the impacts of climate change as what Queensland currently is.

Given the high level and multiple risks that are associated with the States vulnerability to climate change impacts, we strongly urge that a priority outcome of current and future recovery activities must be focused on enabling Queensland's environment, communities and economy to become resilient to future severe weather events.

Our suggestions on ways to improve Queensland's resilience to natural disasters caused by climate change are outlined below.

166 Ann St, Brisbane, QLD 4000
Ph: 07 3221 0188
Fax: 07 3229 7992

ABN: 89 717 887 219
manager@gccqld.org.au
www.gccqld.org.au

2. Resilience

To better prepare Queensland's environment, communities and economy to withstand future severe weather events, it is crucial that a critical priority of the recovery and rebuilding program must be on enabling the state to become resilient to the impacts of future severe weather events.

We believe this can best be achieved by integrating resilience objectives and outcomes across all government agencies and corporations.

In context of preparing Queensland for future extreme weather events, we recommend that the following definition of resilience is adopted:

Resilience is the ability of the environment, and all that depend upon the environment - individuals, communities and businesses - to withstand and readily recover from extreme weather events after having implemented practices that establish a stable climate and sustainable environment to the greatest extent possible.

Recommendation

Undertake a broad sweeping legislative reform process to integrate resilience objectives and outcomes across whole of government.

3. Understanding risk

While there appears to be a relatively high level of awareness about risks associated with natural disasters, the extent of damage caused by the recent floods and storms is clear evidence that addressing risks associated with severe weather events is not adequately reflected in current planning, regulatory and decision making processes.

Given the inadequacies of current regulatory frameworks, there is an urgent need to introduce clear and quantitative assessment processes that determine levels of vulnerability to severe weather impacts. Findings from these assessments should be then expressed clearly in maps that define what parts of the state are vulnerable to different natural disasters – particularly flooding caused by torrential rain and storm surges resulting from cyclones. The many benefits of improved hazard mapping include giving decision-makers an evidence base to justify difficult decisions and also establish a political mandate for action.

Recent events have highlighted the complexity of risks associated with natural disaster assessment. Priority issues and considerations that need to be taken into account when conducting risk assessments include:

- Disaster risks and impacts can be cumulative. (E.g. flooding in parts of the state was exacerbated due to prolonged heavy rainfall that caused catchments to become saturated. Subsequent heavy rainfall was unable to infiltrate, which resulted in extensive flooding)
- Secondary disasters may follow initial disaster events. (it is the secondary disasters that often cause the greater damage)
- Due to climate change, many natural disaster risks are already increasing, particularly the risk of extensive flooding from increased frequency of severe rainfall events.
- Risk analysis must be state-wide. (It is unlikely that future natural disasters will always occur in exactly the same part of the state)
- Risk assessment is the sum of hazard, exposure and vulnerability factors.
- For risk assessments to be effective, they must be communicated openly and without limits

World Bank advisors who recently reviewed Queensland's flood response stressed the need for better risk assessment and hazard mapping to be able to better prepare communities across the state to withstand natural disasters.

Recommendation

A comprehensive program of disaster risk assessment must be undertaken to identify and map natural disaster risks across the state. Cumulative and secondary risk, as well as increased risk under climate change, must be considered.

4. Communicating risk clearly

Given Queensland's vulnerability to the impacts of severe weather events, there is an urgent need to introduce clear and effective communications processes to enable communities and individuals to be able to make informed decisions about where they live, how they prepare for disasters and what insurance they require.

The World Bank advisors also emphasised the need to make information about natural disaster risks widely available and without any restrictions.

Recommendation

A communication strategy must be developed and implemented to freely disseminate information of natural disaster risk to all interested and relevant parties.

4. Institutional and legislative reform

Resilience is a characteristic that applies to both human and natural systems; it is therefore challenging to deliver resilience as a standalone outcome. Instead, we strongly suggest that resilience must become an everyday consideration of government planning, land management and infrastructure delivery processes.

Integration of natural disaster resilience must therefore be regarded as priority outcome across all government agencies, which will require the development and implementation of appropriate legislative and regulatory frameworks.

Through its advocacy, the World Bank has overseen the introduction of natural disaster resilience into government processes in the countries where they operate, which has resulted in key ministries appointing internal disaster coordinators to 'champion' the integration of natural disaster resilience objectives and outcomes into that portfolio. Another example is the approach taken by Germany, who opted to undertake sweeping legislative reform to establish their 2005 Flood Control Act to be able to better withstand natural disasters after the country was severely affected by flooding in 2002.

The cross-cutting plans being developed by the Queensland Reconstruction Authority provides a key opportunity to integrate resilience objectives into the recovery and rebuilding activities that are being undertaken across the state.

Recommendation

Reform all current institutional and legislative frameworks to integrate resilience objectives and outcomes across all government agencies and corporations.

5. Recognising and valuing alternatives to engineering solutions

Due to their apparent certainty and safety, engineering solutions have been heavily relied upon to mitigate natural disasters. However, there is a growing case to recognise the limitations of engineering solutions – particularly in regard to flood mitigation. This is because engineered flood mitigation solutions are often extremely costly to construct and maintain, inadvertently increase risk exposure in communities by creating a false sense of security and have limited ability in reducing flood levels once the capacity of the dam or levee has been reached.

These types of engineered flood mitigation solutions can also fail; with often cataclysmic consequences to downstream communities, infrastructure and the environment. The operation of dams and levees can also exacerbate the impacts of flooding by concentrating floodwaters and reducing the opportunity for water to infiltrate into the surrounding landscape.

Modern best-practice recognises that natural disaster mitigation strategies must optimise a balance between engineered solutions and a range of alternatives, including the use of natural landscape features and functions such as vegetated riparian areas, wetlands, groundwater recharge, coastal and estuary mangroves and floodplain functions.

Natural disaster impact mitigation provided by natural landscape features and functions includes:

- Floodwater infiltration into soils provided from catchments being well-vegetated
- Floodwater absorption provided by healthy wetlands
- Floodwater dissipation provided by maintaining floodplain connectivity
- Storm surge dissipation provided by healthy mangrove and wetland communities in coastal and estuary areas

Along with mitigating the impacts of natural disasters, maintaining and enhancing these natural landscape functions and features also provides a wide range of benefits that support other Queensland Government priorities, such as biodiversity protection and climate change mitigation.

While it can be challenging to economically measure these values, this should not preclude their use in mitigating the impacts of natural disasters. Fortunately, frameworks do exist for the economic valuation of ecosystem services, including disaster mitigation. By assigning dollar values to the disaster mitigation services provided by healthy natural systems, it becomes feasible to compare these options to engineered options within cost-benefit frameworks to ascertain the optimal mix of natural and engineered mitigation.

Overseas experiences in this regard suggest that natural buffers are highly cost-competitive alternatives to pure infrastructure solutions. Frameworks have evolved in some catchments (for example, on the Hudson River in New York) whereby upstream landowners are paid by downstream cities to manage their farms in a way that optimises the delivery of essential ecosystem services. This arrangement gives the farmer a steady supplement to their income, which saves downstream utilities service providers substantial amounts of money that otherwise would have been spent on water treatment facilities.

Arrangements of this sort are often referred to as Payments for Ecosystem Services (PES) frameworks. Work is currently proceeding within SEQ Water to develop frameworks for valuing and promoting ecosystem services in catchments. This work could be invaluable in both the reconstruction effort and in planning Queensland's long-term resilience.

Recommendation

- The full range of engineered and natural disaster mitigation options, should be recognised
- The advice of SEQ Water and relevant experts (e.g. The World Bank) should be sought to develop and implement frameworks for valuing ecosystem services.

6. Planning

State and local governments have a difficult but crucial role to play in increasing Queensland's resilience, both in directing future growth, and integrating resilience objectives and outcomes in existing development and infrastructure.

The development of improved natural disaster hazard mapping is critical to informing planning processes about where development can or should not occur. Prohibiting development from occurring in high-risk areas is prudent for governments, communities and individuals due to the avoided costs of rebuild following future natural disasters. In lower risk areas, triggers in planning schemes should ensure buildings and infrastructure use best-practice designs to minimise disaster vulnerability. It should be noted that insurers will influence development by placing higher premiums on risk-exposed properties; planning must take this driving force into account, and synergise with it wherever possible.

Planning has a strong influence on areas that are subject to existing natural disaster vulnerability and risk. Frameworks must be developed to implement a strategic and phased conversion of highly vulnerable residential and commercial areas to other land uses (for example, through processes of planned residential retreat from coastal areas, or gradual conversion of vulnerable urban areas to parklands as has taken place in New York).

Recommendation

- Develop and incorporate cutting-edge hazard maps into planning processes
- Revise planning schemes to prevent inappropriate developments occurring in areas of high natural disaster vulnerability and risk
- Mandate the requirement that natural disaster resilient design features are incorporated into construction standards that takes place in moderate disaster risk areas.
- Develop frameworks that implements a strategic conversion to other land uses of high-risk areas that have already been developed
- Implement urban design strategies for disaster mitigation in risk-exposed suburbs.
- Recognise that insurance is going to be a substantial force in the urban landscape in years to come, and that this can be useful to planners if agendas are well-aligned.

7. Infrastructure

Queensland Conservation offered a number of specific recommendations with regard to infrastructure in its earlier submission to this inquiry. A number of these had long-term relevance, which we wish to reiterate here:

Recommendations

- There is an urgent need to review and update all standards associated with coal mine storm water management infrastructure to better prepare Central Queensland for future wet seasons. Existing mines should be designed so that they will not be inundated, with maximum use of natural flood mitigation features. The construction of new mines on floodplains and other flood prone environment should not be permitted.
- The standards and guidelines associated with constructing roads and rail corridors located within flood prone need to be urgently reviewed to better prepare Queensland for future wet seasons. The review should take account climate change projections and incorporate resilience objectives and outcomes.

- Given their vulnerability to natural disasters, the standards and guidelines associated with the location, construction and operation of sewage and water treatment plants need to be urgently reviewed. The review should take account climate change projections, incorporate resilience objectives and outcomes and recognise the role that catchment management provides in reducing water treatment costs – particularly in times of heavy rain and flooding by reducing sediment loads entering storages

8. Climate change and natural disaster mitigation

Escalating climatic instability will potentially cause storms, floods, droughts, heat-waves, cyclones and storm surge events to become more frequent and severe in decades to come. While no single state can mitigate climate change entirely, it should be recognised that unless global carbon dioxide concentrations can be stabilised at a safe level (below 450ppm, at the very least), then Queensland will almost certainly face increasing pressure from natural disasters. Thus, Australia's contribution to reducing global atmospheric carbon dioxide concentrations must be seen as a key element of mitigating Queensland's vulnerability to natural disasters.

While natural disaster can cause significant damage, the rebuilding phase following natural disasters is an opportunity to introduce new standards to ensure that communities and infrastructure are better able to withstand the impacts of severe weather events. New standards should adopt a 'Build it Back Green' approach that mandates that domestic and commercial buildings must be largely water and energy self-reliant, both of which are useful resilience measures when natural disasters place pressure on water and electricity grids.

Adopting a 'Building it Back Green' approach following natural disasters will also provide significant opportunities for Queensland to reduce its GHG emissions; thus contributing to better preparing the state to withstand future severe weather events.

It is important to note the similarities between current climate adaptation programs and disaster resilience initiatives. Synergies between these programs of work should be developed and implemented to ensure value for money and to achieve greater outcomes.

Recommendation

- Recognise that a stable climate is the key requirement needed to reduce Queensland's vulnerability to natural disasters
- Recognise that natural disaster reconstruction programs are opportunities to introduce new standards that enable communities and infrastructure to better withstand natural disasters
- Align climate adaptation programs with natural disaster resilience strategies to maximise efficiency in delivering both outcomes

9. Conclusion

We consider the recommendations offered in this submission have the potential to substantially improve Queensland's resilience to natural disasters, along with delivering a range of additional benefits to landscape management and climate change mitigation that will support the objectives and assist achieving outcomes contained in other government programs.

Please contact our office should you require any further information or clarification regarding the matters raised throughout this submission.

Regards,



Toby Hutcheon
Executive Director
Queensland Conservation Council