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| National Disaster Risk Reduction2024-25Competitive Grant ProgramGuidelines |

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| **Opening date:** | 8 am - 28 November 2023 |
| **Closing date and time:** | 12 pm - 5 February 2024 |
| **Grant round:**  | Fifth round: 2024 – 2025  |
| **Total grant funding:** | $2.5 million* $1.0 million to fund projects aimed at reducing disaster risk and building community resilience in alignment with the National Disaster Risk Reduction Framework (NDRRF) – **stream 1 projects**; and
* $1.5 million to fund projects aimed at enhancing disaster resilience within communities in alignment with Community Disaster Resilience Strategy (CDRS) and the NDRRF – **stream 2 projects**
 |
| **Grant funding per project:** | * $10,000 – $250,000 for projects with local impact in both streams
* $10,000 – $1.0 million **for stream 1 projects** with State, region or sector wide impact
* $10,000 – $1.5 million **for stream 2 projects** with State, region or sector wide impact
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| **Enquiries:** | semc.grants@dfes.wa.gov.au |
| **Date guidelines released:** | 23 November 2023 |

# About the National Disaster Risk Reduction grant program

The National Disaster Risk Reduction grant program (NDRR) is funded under the [National Partnership Agreement on Disaster Risk Reduction](https://federalfinancialrelations.gov.au/sites/federalfinancialrelations.gov.au/files/2020-05/disaster_risk_reduction.pdf). The National Partnership Agreement aims to reduce disaster risk and limit the impact of disasters associated with natural hazards on Australian communities and economies by delivering on the priorities, five-year outcomes and 2030 goals of the [National Disaster Risk Reduction Framework](https://www.homeaffairs.gov.au/emergency/files/national-disaster-risk-reduction-framework.pdf) (NDRRF).

The National Partnership Agreement has allocated $12.528 million to Western Australia (WA) over five years from 2019 to 2024. In WA, the State Emergency Management Committee (SEMC) coordinates the distribution of this funding to eligible projects via the NDRR grant program. The Department of Fire and Emergency Services (DFES) administers the NDRR grant program on behalf of the SEMC.

The NDRR aims to increase WA communities’ resilience to disasters through enhanced preparedness for, reduced exposure to, and minimisation of the effects of one or more natural hazards. The NDRR supports projects that:

* take action to reduce existing disaster risk
* minimise creation of future disaster risk
* equip decision-makers with the capabilities and information they need to reduce disaster risk and manage residual risk

# About the Community Disaster Resilience Strategy (CDRS)

The CDRS supports a collaborative and community led approach to disaster resilience. It outlines an approach that empowers communities to consider what will assist their resilience before, during and after a disaster, or should a traumatic event take place, the resources available to be leveraged when needed and where to direct those resources to achieve a positive quality of life into the future.

The strategic focus of the CDRS is divided into four Key Priority Areas designed to give community organisations a mechanism to deliver resilience building efforts that align with their strategic plans. They are:

1. Broaden emergency management
2. Work locally to increase preparedness
3. Collaborate to reduce vulnerability
4. Heal people and communities

# How to apply

Applications must be submitted via the online [application portal](https://dfes.smartygrants.com.au/NDRR2425Round) on the SEMC website. Applicants must complete all mandatory fields and submit the application by
12 pm on 5 February 2024. **Late applications will not be accepted.**

Applicants are responsible for ensuring their applications are complete and accurate. If an error, inconsistency, or omission is identified during the assessment process, DFES may ask for clarification or additional information from the applicant, provided the information does not materially change the nature of their application or disadvantage other applicants.

# Eligibility criteria

Applicants are encouraged to refer to the eligibility check (see Addendum) before proceeding with their application to ensure their proposed project meets all the program requirements.

## Eligible organisations

Applications may be submitted by:

* State government agencies
* Local governments
* Government trading entities
* Incorporated organisations
* Not-for-profit organisations

An organisation may submit multiple applications but will be asked in the application process to prioritise their projects.

Applications may be submitted in partnership with other organisations, but one organisation must be nominated as the lead. The lead organisation will be responsible for all obligations detailed in the Funding Agreement, including reporting to DFES.

## Eligible locations

Projects must be delivered in WA and primarily benefit WA communities.

## Eligible activities

The NDRR will fund activities that increase community resilience to disasters through enhanced preparedness for, reduced exposure to, or minimisation of the effects of one or more natural hazards. This can be achieved by developing or improving grey[[1]](#footnote-1) or blue-green[[2]](#footnote-2) infrastructure or undertaking systemic risk[[3]](#footnote-3) reduction initiatives.

To be eligible for NDRR funding, projects must address at least one of each of the:

* **4 priorities of the NDRRF** (Table 1)
1. Understand disaster risk
2. Accountable decisions
3. Enhanced investment
4. Governance, ownership, and responsibility
* **12 State Priority Action Areas** (Table 2)
1. Community-focused resilience
2. Risk data and information sharing
3. Vulnerable / at-risk people and communities
4. Fostering individual responsibility
5. Business continuity and resilience
6. Security of supply chains and infrastructure
7. Essential services: alternatives and supply security
8. Building codes, legislation, and enforcement
9. Heritage and the natural environment
10. Aboriginal communities and cultural heritage
11. Innovation, Research and Design
12. Climate Change
* **7 managed natural hazards:**
1. Bushfire
2. Cyclone
3. Earthquake
4. Flood
5. Heatwave
6. Storm
7. Tsunami

To be eligible for the CDRS component of the NDRR funding, projects must also align with the intent of the [CDRS](https://www.wa.gov.au/government/publications/wa-community-disaster-resilience-strategy) and with at least one of the four Key Priority Areas.

* **4 Key Priority Areas** (Table 3)**:**
1. Broaden emergency management
2. Work locally to increase preparedness
3. Collaborate to reduce vulnerability
4. Heal people and communities

*Table 1: Priorities and strategies of the National Disaster Risk Reduction Framework (*[*https://www.homeaffairs.gov.au/emergency/files/national-disaster-risk-reduction-framework.pdf*](https://www.homeaffairs.gov.au/emergency/files/national-disaster-risk-reduction-framework.pdf)*)*

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| **PRIORITY 1:****Understand disaster risk** |  | **PRIORITY 2:****Accountable decisions** |
| 1. Improve public awareness of, and engagement on, disaster risks and impacts.
2. Identify and address data, information, and resource gaps.
3. Address technical barriers to data and information sharing and availability.
4. Integrate plausible future scenarios into planning.
5. Develop cohesive disaster risk information access and communication capabilities to deliver actionable disaster risk data and information.
6. Support long-term and solution-driven research, innovation and knowledge practices, and disaster risk education.
7. Improve disclosure of disaster risk to all stakeholders.
 |  | 1. Consider potential avoided loss (tangible and intangible) and broader benefits in all relevant decisions.
2. Identify highest priority disaster risks and mitigation opportunities.
3. Build the capability and capacity of decision-makers to actively address disaster risk in policy, program, and investment decisions.
4. Establish proactive incentives, and address disincentives and barriers, to reducing disaster risk.
5. Maintain planning and development practices that adapt to rapid social, economic, environmental, and cultural change.
6. Promote compliance with, and embed resilience requirements into, relevant standards, codes, and specifications.
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| **PRIORITY 3:****Enhanced investment** |  | **PRIORITY 4:****Governance, ownership & responsibility** |
| 1. Pursue collaborative commercial financing options for disaster risk reduction initiatives.
2. Develop disaster risk reduction investment tools to provide practical guidance on investment mechanisms.
3. Leverage existing and future government programs to fund priority risk reduction measures.
4. Identify additional current and future potential funding streams.
5. Improve the accessibility, variety, and uptake of insurance.
6. Empower communities, individuals, and small businesses to make informed and sustainable investments.
 |  | 1. Establish a national mechanism to oversee and guide disaster risk reduction efforts and cross-sector dependencies.
2. Establish a national implementation plan for the NDRRF.
3. Support and enable locally led and owned place-based disaster risk reduction efforts.
4. Encourage improved transparency of disaster risk ownership through personal and business transactions.
5. Consistently report on disaster risk reduction efforts and outcomes.
6. Create clear governance pathways for pursuing disaster risk reduction projects.
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Table 2: Priority action areas, including from the WA Implementation Plan for the National Disaster Risk Reduction Framework (<https://www.wa.gov.au/system/files/2022-08/NDRR%20WA%20Implementation%20Plan.PDF>)

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| ACTION AREA | DESCRIPTION |
| 1. Community-focused resilience
 | Building communities that can support themselves and work together to understand and minimise risk from disasters. |
| 1. Risk data and information sharing
 | Developing and promoting knowledge and understanding of disaster risk through research, knowledge sharing, exercises, and lessons management. |
| 1. Vulnerable / at-risk people and communities
 | Targeted action to improve disaster risk reduction for vulnerable / at-risk people and communities. |
| 1. Fostering individual responsibility
 | Increasing people’s understanding of their responsibility to manage to disaster risk, and consequently improve risk reduction on the individual level. |
| 1. Business continuity and resilience
 | Increasing organisations’ understanding of their responsibility to manage disaster risk, and consequently improve risk reduction at the industry level. |
| 1. Security of supply chains and infrastructure
 | Planning and research to better understand the limitations of supply chains and related infrastructure across the State, and improve collaboration and coordination between government, industry, and communities. |
| 1. Essential services: alternatives and supply security
 | Understanding and implementing alternative solutions to essential service supply to enable communities, industry, and government to provide cost effective mitigation of disaster risk to essential services. |
| 1. Building codes, legislation and enforcement
 | Research and analysis of the most cost-effective adaptations to enhance the resilience of the built environment to reduce the risk of disasters to key assets. |
| 1. Heritage and the natural environment
 | Research to enhance understanding of the exposure and vulnerability of the natural environment and heritage sites to disaster risk and planning and works to reduce this risk. |
| 1. Aboriginal communities and cultural heritage
 | Culturally appropriate initiatives to enhance the resilience of Aboriginal people and communities to natural hazards including reducing disaster risk to significant places and practices. |
| 1. Innovation, Research and Design
 | Supporting innovative ideas to ensure risk reduction initiatives are adaptable and remain relevant to the NDRRF and funding is targeted to best effect.  |
| 1. Climate Change
 | Managing risks associated with the impact of a changing climate on natural hazards. |

*Table 3: WA Community Disaster Resilience Strategy - Key Priority Areas*

*(*[WA Community Disaster Resilience Strategy](https://www.wa.gov.au/government/publications/wa-community-disaster-resilience-strategy))

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| **KEY PRIORITY AREA / ISSUES** | **PROPOSED INITIATIVES** |
| 1. **Broaden Emergency Management**

The wider community has limited opportunity for involvement. | * Consider the membership and agenda of Emergency Management committees
* Increase engagement with peak bodies and industry groups
* Create more pathways to volunteer and help in emergencies
* Improve access to information about risk and emergencies
 |
| 1. **Work Locally to Increase Preparedness**

Current Emergency Management arrangements and community preparedness activities do not necessarily equip communities with the essential knowledge and skills and are not scaled to augment local capacity.  | * Foster community-led behaviour change for preparedness
* Enable interactive community mapping for risk reduction
* Engage community in planning for recovery
* Equip young adults, youth and children with the skills for disaster resilience
 |
| 1. **Collaborate to Reduce Vulnerability**

Older people, people with disability, people from culturally and linguistically diverse backgrounds and people experiencing homelessness are more likely to be impacted by an emergency or disaster. | * Co-design a personal safety planning process
* Create community processes for translation of emergency information
* Develop lifelines and safe pathways for people experiencing homelessness and people at greater risk
* Partner with Aboriginal communities for emergency response
* Explore the role of districts in supporting small communities
 |
| 1. **Heal People and Communities**

The impacts of trauma, and the priority of assisting people and communities to heal, are not explicitly recognised in Emergency Management arrangements and practices. | * Reduce the barriers to accessing mental health support
* Increase knowledge of person-centred, trauma-informed and inclusive practices
* Improve support for local leaders of social recovery
* Strengthen financial safety nets
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# Funding

## Available funding

A total of $2.5 million is available in the 2024-25 NDRR funding round:

* $1.0 million to fund projects aimed at reducing disaster risk and building community resilience in alignment with the National Disaster Risk Reduction Framework (NDRRF) – **stream 1 projects**; and
* $1.5 million to fund projects aimed at enhancing disaster resilience within communities in alignment with Community Disaster Resilience Strategy (CDRS) and the NDRRF – **stream 2 projects**

Applicants for individual projects may apply for:

* $10,000 – $250,000 for projects with local impact **in both streams**
* $10,000 – $1.0 million **for stream 1 projects** with State, region or sector wide impact
* $10,000 – $1.5 million **for stream 2 CDRS projects** with State, region or sector wide impact

**No GST is applied to NDRR funds.**

State, region, or sector wide risk reduction must be demonstrated in relation to one or more of the following themes:

1. **Strategic research**: Research that will significantly improve knowledge and decision-making or inform legislation and policy in relation to natural hazard or disaster risk management.
2. **New technologies, systems or tools**: Development of tools, technologies and/or systems that materially improve coordination, efficiency and information sharing in relation to risk reduction and management of natural hazards.
3. **State or regional resilience initiatives:** Activities that improve community resilience and reduce the potential impacts of disasters on communities and infrastructure at a regional or State-wide level.
4. **Multi-sector initiatives:** Projects that improve integration of disaster risk knowledge and risk reduction action across multiple sectors.
5. **Climate change:** Projects that improve broad scale understanding and management of natural hazards caused or exacerbated by a changing climate.

Applicants are encouraged to consider collaboration with other agencies to maximise potential project outcomes and funding arrangements.

## Co-contribution

Applicants must contribute at least 50 percent of the total cost of the project as some combination of cash and in-kind. In-kind contributions must be expressed in monetary terms supported by calculations.

In kind contributions may include:

* Wages of personnel directly contributing to the delivery of the project.
* An appropriate percentage of the wages of staff not dedicated to the project, but required to provide input to it e.g. managers or stakeholders providing advice about the project or making decisions about its outcomes and outputs.
* Supplies, materials, specific equipment required to execute the project.
* Facilities used for project activities such as meetings or workshops.
* Goods and services used for the project that are otherwise funded for other purposes such as IT services and facility overheads.

Business as usual activities cannot form any component of the in-kind contribution.

If successful, the project must provide evidence of the proposed in-kind contribution prior to signing a Funding Agreement, including by providing letters of support from any partner organisations.

All in kind contributions must be directly attributable to the delivery of the project, itemised on the application and tracked throughout project delivery to facilitate reporting.

## Project budget

Applicants must submit a detailed budget that specifies the nature and purpose of all expenditure on the project. The budget must differentiate between and detail:

1. NDRR funding.
2. Cash to be contributed by the applicant organisation and any partner organisations.
3. In-kind contributions to be made by the applicant organisation and any partner organisations.

Expenditure against these categories will be required to be evidenced throughout the project. Business as usual activities should not be included in any component of the budget.

## Eligible expenditure

Eligible expenditure are costs directly associated with delivering the activities specified in the project application and subsequent Funding Agreement. For example:

* Procurement and supply of materials and construction costs to deliver infrastructure.
* Staff, contractor and consultant salaries, wages, fees, and on-costs including administration, utilities and travel that are directly attributed to the project activities.
* Writing, reporting, consultation, and engagement costs that are directly relevant to delivering the project.
* Community engagement and communications initiatives directly related to delivering the project.
* Hire of venues and equipment required for project activities.
* Modest catering costs where they relate to meetings, workshops or travel that is essential to delivering the project.

## Ineligible expenditure

The following may not be purchased using granted funds or used as a component of co-contribution:

* Salary, wages or consultancy or contractor fees not directly attributable to delivering the project.
* Costs incurred prior to the signing of the Funding Agreement, including costs associated with developing the grant application.
* Activities conducted outside of Western Australia.
* Interstate or international travel.
* Alcohol including in relation to hospitality, functions, events, catering, corporate travel, bar tabs, mini bars and personal use.
* Medication including prescription or ‘over the counter’ medication.
* Mementos provided to participants at grant funded events unless approved in the Funding Agreement. Examples of mementos are branded or personalised pens, caps, coffee mugs, and t-shirts.
* Coffee unless purchased as part of catering for a meeting, workshop or travel that is essential to delivering the project.
* Gifts of any consumer items, goods and services, samples, discounts, and cash, including tickets to entertainment events.
* Hospitality except if approved in the Funding Agreement. Hospitality includes providing meals, accommodation or travel to stakeholders, conference delegates and official visitors.
* Benefits that bestow personal advantage on the purchaser due to special offers, loyalty reward schemes, frequent flyer points, or other benefit schemes.
* Any other transaction disallowed by the terms and conditions set out in the Funding Agreement or any other applicable written law, policy, instruction or standard.

## Project duration

The NDRR targets projects of up to 12 months duration. Consideration may be given to projects up to 24 months if there is demonstratable need for longer duration.

# The application

Applications must be submitted via the [application portal](https://dfes.smartygrants.com.au/NDRR2425Round) between 8 am on 28 November 2023 and 12 pm on 5 February 2024. Applicants must complete all mandatory fields in the application form.

A confirmation email with a unique application reference number will be sent upon application submission.

A strong application will fully justify the need for the project, demonstrate how it will reduce disaster risk and explain the benefit/s it will deliver to the WA community in the context of the NDRR program objectives and CDRS priorities (if applicable). Applicants should also demonstrate how their project provides value-for-money.

The application should include a description of project deliverables comprising:

* Outputs (products) of the project.
* Outcomes (effect) of the project.
* Milestones that will be met in delivering the project and their anticipated timing.
* Key performance indicators that will facilitate measurement of the project.

## Inclusivity

Projects should ensure outputs and outcomes are accessible to, and deliver equitable outcomes for, people from culturally and linguistically diverse backgrounds, people living with disability and other groups that may be marginalised from mainstream disaster risk reduction initiatives. Where appropriate, principles of co-design should be applied to ensure programs are inclusive.

## Ineligible Applications

Applications must be submitted through the online portal. Applications received through post and emails will not be accepted.

No extensions will be granted, and late and incomplete applications will not be accepted. Applications not endorsed by an authorised representative of the applicant organisation will not be accepted.

## Assistance for Applicants

The DFES Disaster Risk Reduction Branch is available to provide guidance on these Guidelines and the application process. Please contact semc.grants@dfes.wa.gov.au for assistance.

Answers to Frequently Asked Questions are available on the [SEMC website](https://www.wa.gov.au/organisation/state-emergency-management-committee/apply-national-disaster-risk-reduction-grant) to help with the application process.

# Assessment

The information provided by applicants will be used by the assessment panel to determine which projects best meet the NDRR program objectives and CDRS priorities (if applicable) and provide value for money. A panel comprising representatives of SEMC member organisations will be convened to assess applications and recommend projects to the SEMC for funding. An independent probity advisor will oversee the merit selection process.

The assessment process is as follows:

1. Applications submitted.
2. Eligibility check completed by DFES.
3. Merit assessment scoring by an assessment panel appointed by DFES.
4. Recommended projects submitted to SEMC for approval.
5. Approved projects submitted to the Minister for Emergency Services.
6. Federal and State Ministers issue joint media release advising the outcomes.
7. Written notification of assessment outcome provided to applicants.

## Selection Criteria

Before assessment begins, eligibility will be checked by DFES to ensure projects comply with the eligibility criteria. Any applications that do not meet these criteria will not be progressed to the assessment stage.

An assessment panel will be convened by DFES and chaired by the Executive Manager of the SEMC Business Unit (or a delegated authority). Panel members are selected from SEMC member organisations based on their knowledge of emergency management, risk management, financial management or project management or because they have specialised knowledge of relevant hazards or project activities.

The assessment panel will include representatives of at least three organisations external to DFES, with one of those representatives having expertise in grant governance. The assessment panel will also include Aboriginal representation, and an independent probity advisor to identify and advise on conflicts of interest during the merit selection process.

The assessment panel will apply the assessment criteria provided in this guideline to prioritise projects from most to least preferred. All questions in the application contribute to the assessment of the selection criteria. In allocating funding, the assessment panel may give consideration to achieving diversity in activity types, project geographic locations, organisational types and hazards addressed.

The assessment criteria are scored as follows, with the sum of the category scores providing the overall score for the project:

|  |  |
| --- | --- |
| CATEGORY | SCORE |
| Validity of the project | 20 |
| Benefit of the project | 20 |
| Value for money | 20 |
| Project deliverables | 20 |
| Capacity to deliver | 20 |

### Validity of the project

This criterion addresses how the project aligns with the NDRRF, the CDRS and the WA Implementation Plan priorities and demonstrates disaster risk reduction. It includes consideration of the risks the project aims to address, the evidence these risks are a priority to be managed and how the project will reduce them.

### Benefit of the project

This criterion addresses how the project will benefit the WA community. It includes consideration of the breadth of impact across different segments of the community with particular emphasis on at-risk or disadvantaged groups. It also considers the long-term benefits to the State and how they will be sustained after the project concludes.

### Value for money

This criterion considers the impact of the project in relation to its cost. This includes an assessment of the feasibility of conducting the planned activities within the described budget and timeframes. The suitability of the NDRR as the funding source for the project is also considered.

### Project deliverables

This criterion assesses if the project deliverables are clear, appropriate, and realistic. This includes the relationship between outputs and outcomes and the likelihood of achieving both.

### Capacity of deliver

This criterion considers whether the organisation is positioned to deliver the project and achieve the proposed outcomes.

# Successful Projects

If your application is successful, the following steps will ensue:

1. DFES drafts a Funding Agreement based on the information provided in the application and provide it to the applicant.
2. Some limited negotiation of the terms of the agreement may occur, provided these do not significantly alter the nature of the project, its deliverables, milestones, or budget.
3. The Funding Agreement is signed by representatives of the SEMC and the grant recipient.
4. The Project commences, including requirement to provide progress reports to DFES.
5. The First instalment is paid to grant recipient (usually 50% of the grant value) after evidence of completion of required milestones.
6. The project progresses and provides routine progress reports to DFES demonstrating achievement of milestones, outcomes and KPIs.
7. The project concludes and the final report is submitted within 8 weeks of completion of the last milestone.
8. DFES reviews the final report, project acquittal and accompanying evidence.
9. DFES pays the final instalment (value depends on actual project expenditure).
10. The applicant may be requested to deliver a one-hour webinar on project topic, outcomes, community benefits, lessons learnt, and any other relevant criteria, to relevant stakeholders.

## Reporting

Projects funded by the NDRR grant program will be required to complete performance reporting, describing progress toward milestones and expenditure. A project closure report is also required upon conclusion of the project.

# ADDENDUM 1 – Eligibility Check

Applicants must confirm each of the below requirements to be eligible for NDRR funding.

## SECTION 1. My organisation:

* + Will comply with the terms of the NDRR Funding Agreement.
	+ Does not have any non-compliant Natural Disaster Resilience Program, National Disaster Risk Reduction or All West Australians Reducing Emergencies grants.
	+ Is incorporated and has an ABN.

## SECTION 2. My project:

* Will directly benefit the WA community.
* Addresses at least one [National Disaster Risk Reduction Framework](https://www.homeaffairs.gov.au/emergency/files/national-disaster-risk-reduction-framework.pdf) priority.
* Addresses at least one of the [12 State Priority Action Areas](https://www.wa.gov.au/government/publications/12-state-priority-action-areas).
* Addresses at least one of the seven [managed natural hazards.](https://www.wa.gov.au/government/publications/7-managed-natural-hazards)
* Aligns with the intent of the [CDRS](https://www.wa.gov.au/government/publications/wa-community-disaster-resilience-strategy) and one of the [Key Priority Areas](https://www.wa.gov.au/government/publications/4-key-priority-areas-of-community-disaster-resilience-strategy) (if applicable).
* For applying for funds to prepare and build resilience from a natural hazard.
* Aligns with the policies and intentions of the Australian and Western Australian Governments for disaster risk reduction.
* Delivers sustained outcomes in disaster risk reduction and will not require ongoing NDRR funding to be sustainable.
* Serves the public interest and does not provide a commercial advantage.
* Does not have a more appropriate funding source or should not be delivered by a more appropriate organisation.
* Will not commence before the Funding Agreement is signed and will commence prior to 1 July 2025.
* Is not part of my organisation’s ordinary function or responsibilities (business as usual).
* Has had a risk assessment completed for the delivery of the project.
* For research projects, is supported by the relevant Hazard Management Agency.

## SECTION 3. My application:

* Is endorsed by the Chief Executive Officer (or equivalent) and Chief Financial Officer (or equivalent)
* Identifies at least 50% of the project's total costs in cash or in-kind contributions, provided by my organisation or other confirmed sources.
1. Engineered assets that reduce the risk of hazards for a community. [↑](#footnote-ref-1)
2. Strategically planned natural and semi-natural areas designed and managed to reduce disaster risk and deliver ecosystem services. [↑](#footnote-ref-2)
3. Systemic risks emerge from the interactions of climate change and natural hazards, with the complex, interdependent and interconnected networks of social, technical, environmental, and economic systems (Australian Institute of Disaster Resilience *Systemic Disaster Risk Handbook*). [↑](#footnote-ref-3)