

Northern Territory Climate Change Risk Assessment 2024: Summary Report

Department of Environment, Parks and Water Security – Office of Climate Change

The 2024 First Pass Climate Risk Assessment for the Northern Territory

What is a climate change risk assessment?

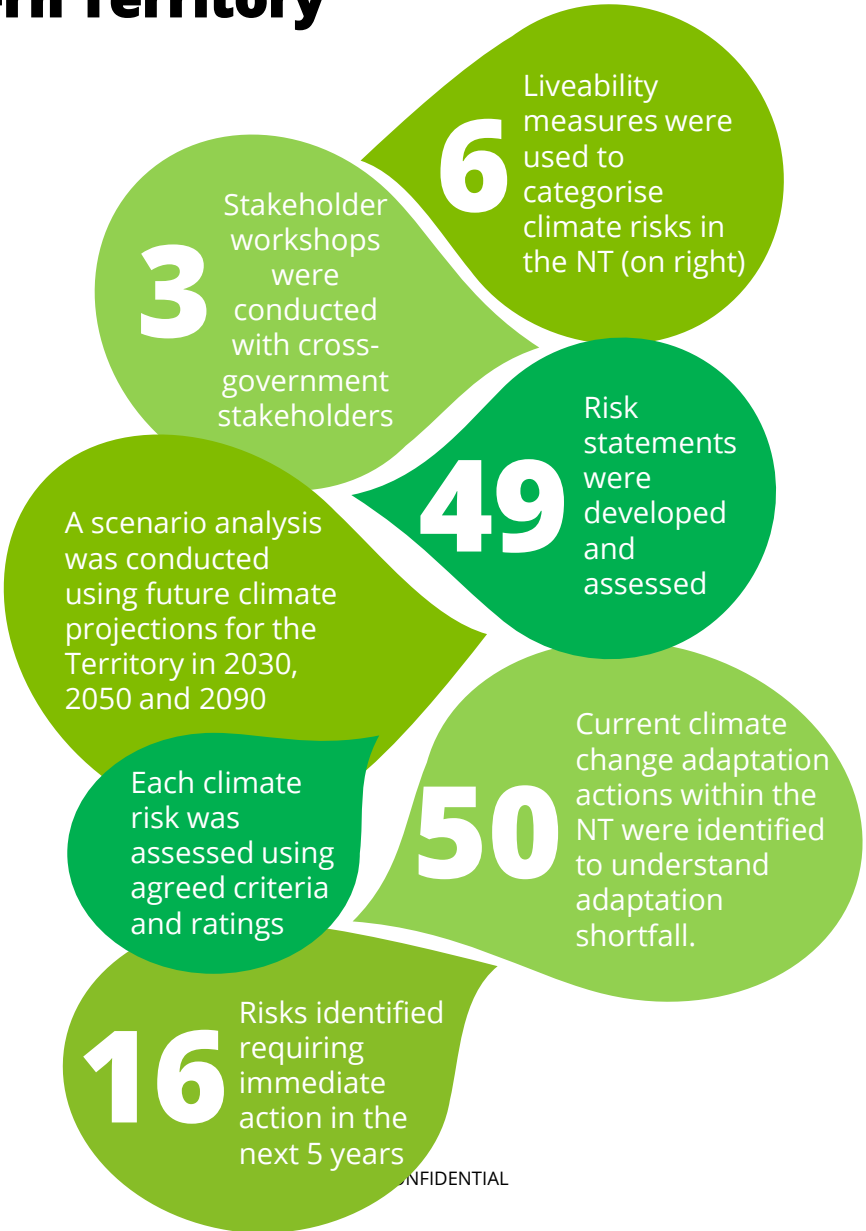
Climate change risk assessments aim to better understand how people, places and environments could be impacted by ongoing and future climate change. Future projections from climate models are used along with expert stakeholder input to identify risks that needs urgent attention.

What is the Northern Territory doing?

The Department of Environment, Parks and Water Security (DEPWS) engaged Deloitte to undertake the Territory's First Climate Change Risk Assessment (NT CCRA). The objective of the NT CCRA was to identify and prioritise the climate change risks which have the potential to impact the future liveability of the Territory.

Why is the Territory doing this?

This climate change risk assessments provides the Territory with information to guide immediate and future decision making and increase the knowledge of potential impacts to various parts of the community, economy and environment.



The Northern Territory liveability measures



Safe and stable natural environment
Natural systems are functional and resilient in the face of climate change through adaptation action that protects the environment, sustainably manages different uses and maintains ecosystems and biodiversity



Community health and wellbeing
Society, government, communities, families and individuals of the NT have the capacity and resources to adapt to and avoid the worst impacts of climate change and to maintain health, wellbeing, prosperity and cultural livelihoods.



Resource security (including water, energy and food security)

- Water security** is having an acceptable quantity and quality of water for people, economic opportunities, cultural and environmental needs, now and in the future.
- Energy security** is about ensuring sufficient, affordable and sustainable energy resources to meet Territorian energy needs, today and in the future.
- Food security** relates to the economic and physical access to culturally appropriate, safe and sufficient healthy food and the ability to store and utilise it.



Natural disaster readiness
Arrangements to ensure that, should an emergency occur, all the resources and services that are needed to cope with the effects can be efficiently mobilised and deployed.



Economic sustainability
Climate risks to the NT's economy, businesses, industries and workers are managed ensuring a climate-resilient future, including the creation of new jobs and industries generated by a low carbon economy, an investment in clean technologies and infrastructure projects.



Safe and stable built environment
The NT's built environment, utilities and physical infrastructure are developed and maintained to prevent, withstand and recover from the impact of climate change.

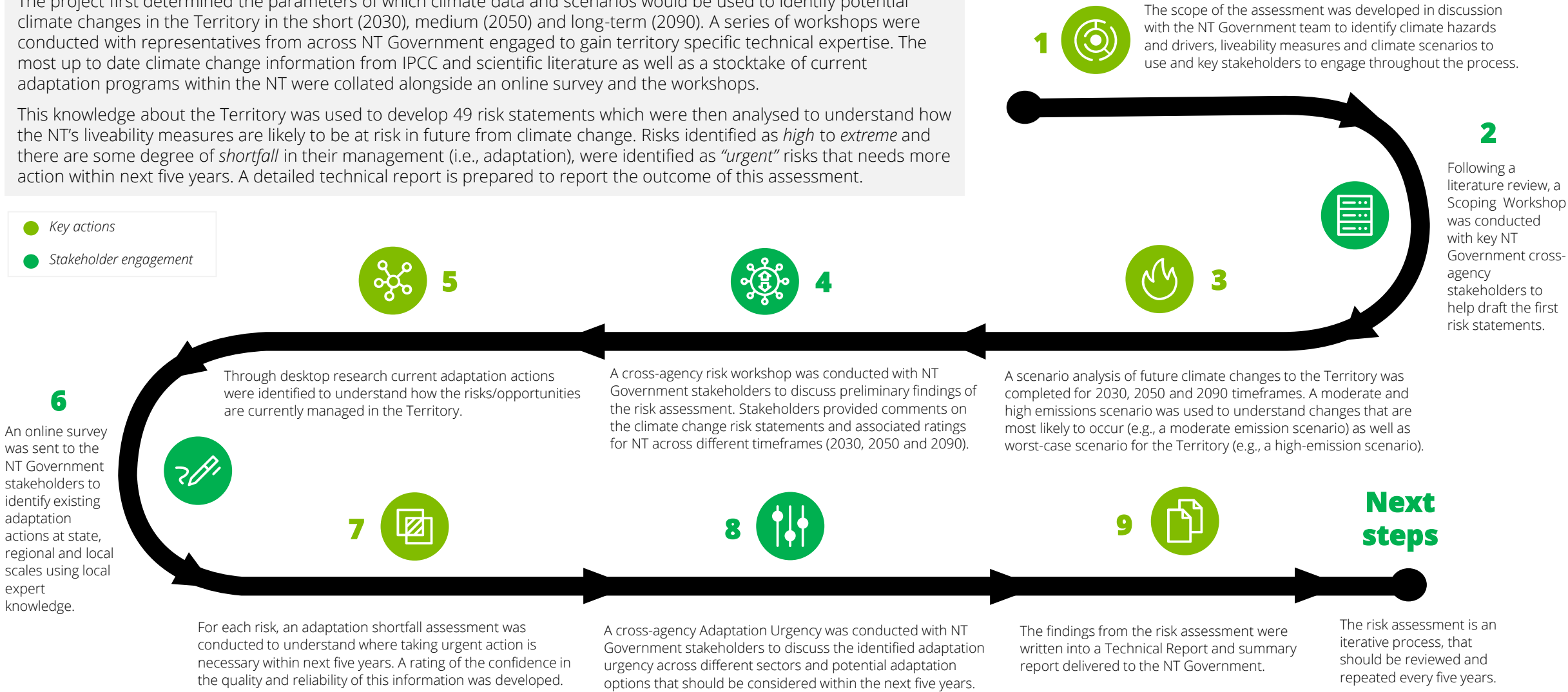
Overview of the risk assessment process

Deloitte was engaged by the NT Government to conduct an inaugural Territory-wide climate risk assessment.

The project first determined the parameters of which climate data and scenarios would be used to identify potential climate changes in the Territory in the short (2030), medium (2050) and long-term (2090). A series of workshops were conducted with representatives from across NT Government engaged to gain territory specific technical expertise. The most up to date climate change information from IPCC and scientific literature as well as a stocktake of current adaptation programs within the NT were collated alongside an online survey and the workshops.

This knowledge about the Territory was used to develop 49 risk statements which were then analysed to understand how the NT's liveability measures are likely to be at risk in future from climate change. Risks identified as *high* to *extreme* and there are some degree of *shortfall* in their management (i.e., adaptation), were identified as "*urgent*" risks that needs more action within next five years. A detailed technical report is prepared to report the outcome of this assessment.

- Key actions
- Stakeholder engagement



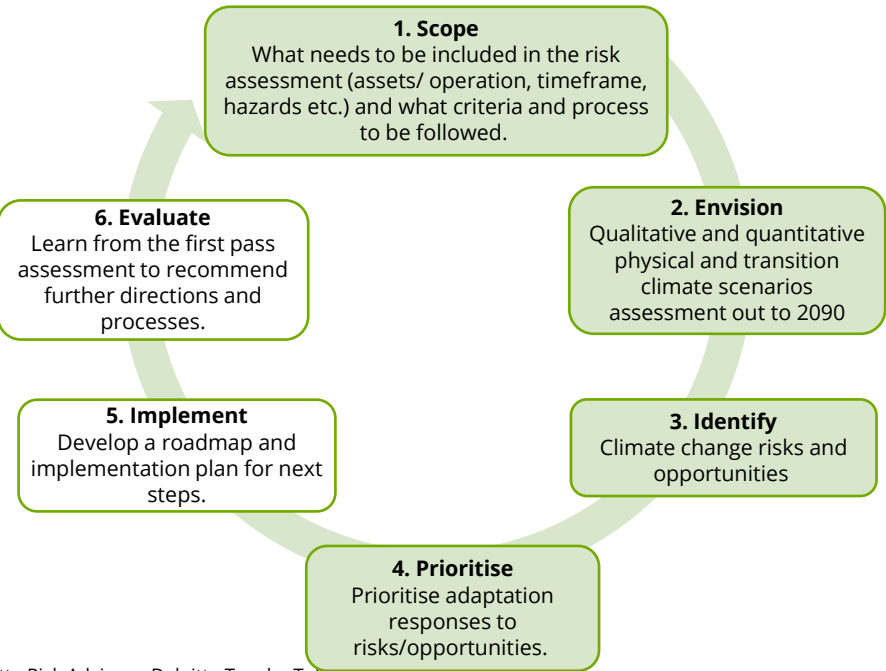
The climate risk framework & approach adopted by the NT CCRA

The NT CCRA first-pass risk assessment approach was based on the Scan Cycle of a risk management process, described below. This is based on national and international best practice of climate change risk management e.g., ISO14091:2021, the National Climate Risk Assessment of Australia (NCRA), New Zealand Climate Change Risk Assessment (NZCCRA), UK Climate Change Risk Assessment (UK CCRA).

The Scan Cycle is a first-pass assessment process which is often conducted to assess high-level climate change risks where urgent actions are necessary.

As a first-pass risk assessment, the scope of the NT CCRA was limited to the first four steps of this framework: *Scope, Envision, Identify and Prioritise*.

The Scan Cycle Risk Framework



High-level overview of the NT CCRA risk assessment approach

1. Scope

a) What should be included in the climate change risk assessment for the NT?

Process:

Adopt best practice approach and tailor through scoping workshop with stakeholders.

Output:

- Key parameters to be considered in the risk assessment (liveability measures, systems, time horizon, climate change scenarios, type of hazards and risk to be covered etc.)

2. Envision

a. How could the NT be impacted by a changing climate?

Process:

- Literature review; and
- Identification of preliminary risks for NT across all liveability measures.

Output:

- Preliminary list of impact statements

3. Identify

a. What is the current and future level of physical and transition risk/opportunity?

Process:

- Literature review;
- Risk workshop; and
- Scenario analysis.

Output:

- Refined list of priority risks;
- List of opportunities;
- Risk rating (including consequence); and
- Confidence ratings.

4. Prioritise

- a. How is the risk/opportunity being currently managed?**
- b. Is risk treatment urgent? Are there benefits from further action in the next five years, over and above what is already planned?**

Process:

- Online survey to identify ongoing or planned adaptation in NT; and
- Adaptation priority workshop.

Output:

- Short list of priority risks for the Northern Territory Government.

Climate change in the Northern Territory

The Northern Territory's unique environment, diverse communities and economy are vulnerable to the changing climate.

The Territory has experienced a 1.5°C increase in average temperatures since 1910, and greater frequencies of hot days and fewer frost days will be expected in the southern part of the Territory, under both scenarios.

The natural rainfall variability and extreme rainfall events are predicted to increase. Additionally, the Territory is likely to spend more time in harsher and more frequent drought and fire weather.

These changes in climate are likely to have significant impact to key industry sectors such as agribusiness and have potentially devastating flow on socio-economic implications.



The NT will be hotter, more often

Substantial increase in temperature on average (which has already increase by 1.5°C), temperature maximums, and an increase in frequency of extreme heatwaves. For example, as illustrated on the right, under a high emission scenario, large parts of the NT are likely to experience significant increase in the number of days over 40°C by 2050.



Rising sea levels

Under a high emissions scenario, sea levels are projected to rise by 57cm above current levels by 2090.



More frequent sea level extremes

Higher sea levels will increase the risk of more frequent overtopping and inundation as well as erosion in the coastal areas and Islands of NT.



More intense rainfall and flooding events

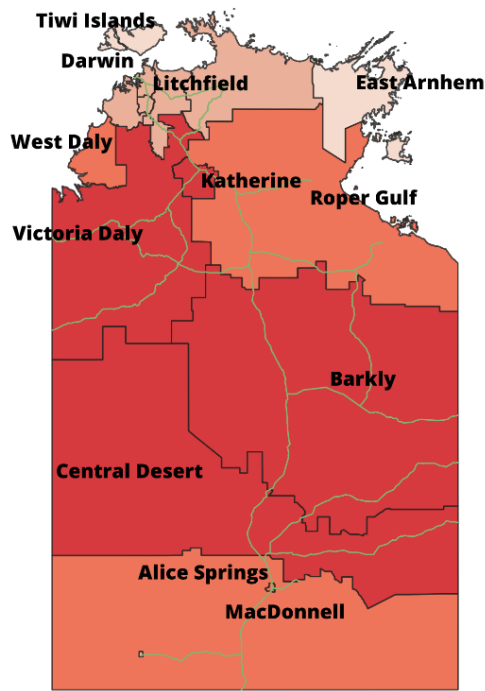
The Northern Territory is already being impacted and is expected to experience more intense rainfall events. Projections indicate that the Territory is likely to experience an increase in the frequency and intensity of extreme rainfall, which is conducive to flooding events.



Drier conditions and less annual rainfall

While the Territory is projected to experience more frequent and intense extreme rainfall, projections indicate that there will be variability in the total annual rainfall, with many regions projected to experience a decrease in annual rainfall. Soil moisture content is also projected to decrease, and dry spells are likely to increase for large parts of the Territory.

The projected exposure of the NT regions to days over 40°C in 2050 (high emissions scenario)



The darker the red, the more significant the exposure is projected to be

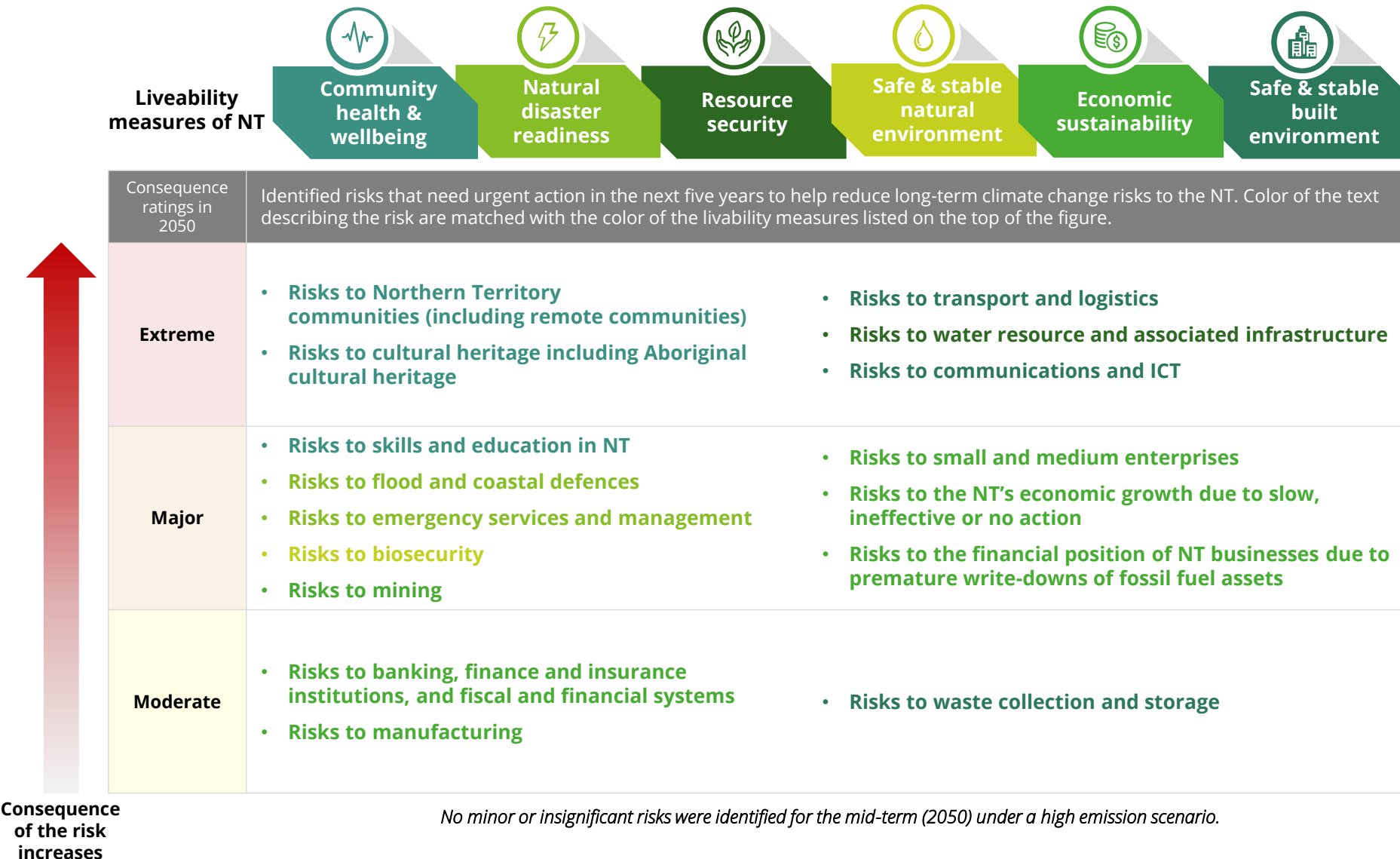
Climate change risks that require urgent action in the Northern Territory

As part of the 2024 NT CCRA, 49 physical and transition risk were identified and assessed, grouped by the Territory's six liveability measures.

The assessment identified that out of the 49 assessed risks, 16 of these require the most immediate and urgent action. These 16 risks require additional government action, above and beyond what is currently being done, within the next five years to reduce the longer-term climate change risks.

The figure on the right lists these 16 urgent risks and distributes them based on their expected consequence in the mid-term i.e., 2050 (e.g., Extreme, Major, Moderate etc.).

To help understand how these risks are distributed across different liveability measures, the colour of the text describing the risk are matched with the colour of the livability measures listed on the top of the figure.



How climate change will impact the NT 16 most urgent risks



Community health & wellbeing

- **NT communities**, particularly those living in the most remote parts of the Territory, will be impacted, resulting in limited transport or inability to access or leave communities. This could impact access to food, healthcare and other resources.
- **Cultural heritage** including cultural practices and ceremonies may be impacted by increased climate events limiting transport and access to specific sites as well as damage.
- **Skills and education** in the NT are impacted by extreme weather events disrupting student engagement and altering workforce capabilities and industry skills demands.



Natural disaster readiness

- **Emergency services and management** is exposed to physical risk from increased extreme events e.g., extreme heatwaves, resulting in increased demand for emergency services and fatigue. These conditions can contribute to burn out in staff and volunteers and create challenges attracting and retaining staff or volunteers.
- **Flood and coastal defences** are at risk from projected increases in extreme rainfall, floods, cyclones and storm surges and will likely place significant stress on existing flood and coastal defences, leading to more frequent breaches and failures and the need for frequent maintenance, repair, and upgrades, resulting in higher costs.



Resource security

- **Water resources and associated infrastructure** is expected to be impacted by climate. Increased risk of water contamination in flooding events and increased drought, coupled with projected population and industry growth, will create increased pressure on the Territory's water resources and infrastructure. Water allocated for mining and onshore gas is also expected to increase in the future, impacting water access for remote and regional communities.



Economic sustainability

- **Banking and finance** institutions will be impacted by increased climate events, having flow on affects to loan approvals and insurance affordability.
- **Mining** operations are at risk of being cut off from flooded transport routes leading to supply delays and workforce impacts from extreme heat.
- **Manufacturing** is impacted by expected supply chain delays and worker health and safety concerns from extreme temperatures.
- **Small to medium businesses** could face increased financial pressure due to unexpected costs from climate change damages resultant rising insurance premiums.
- **Financial position of the NT** may experience higher risks of stranded assets and increased capital expenditure from increased climate events.
- **Slow economic growth** may be exacerbated by climate change, delivering more uncertainty as events such as extreme heat and cyclones occur more often disrupting businesses and workforce.



Safe & stable built environment

- **Communications and ICT** in the NT are exposed to physical risks due to ongoing climatic changes and more frequent and intense extreme weather events causing costly damage to infrastructure and assets, cutting off communities from one another and emergency services.
- **Transportation and logistics infrastructure** in the NT are crucial to the liveability of the Territory. Climate hazards can cause major delays, having flow on effects to community and economic prosperity.
- **Waste collection and storage** are exposed to physical risks which will likely lead to intensified damage to infrastructure and impeding operations.



Safe & stable natural environment

- **Biosecurity** risks from invasive animals, weed species and diseases are expected to increase across the Territory. Their spread contributes to decreased agriculture production, community health outbreaks and damage to ecosystems through outcompeting native species, especially in remote communities and areas where land may be inaccessible.

Complex and interacting risks for the NT

What is complex risk?

Complex risk is a key consideration when assessing risks and opportunities related to climate change in the Northern Territory. Complex risks result from multiple climate hazards occurring concurrently, and from multiple risks interacting, compounding overall risk and resulting in risks transmitting through interconnected systems and across regions, including the flow on impacts to the Territory from more frequent hazards occurring interstate. For example, freight transport delays due to road closures in neighbouring states.

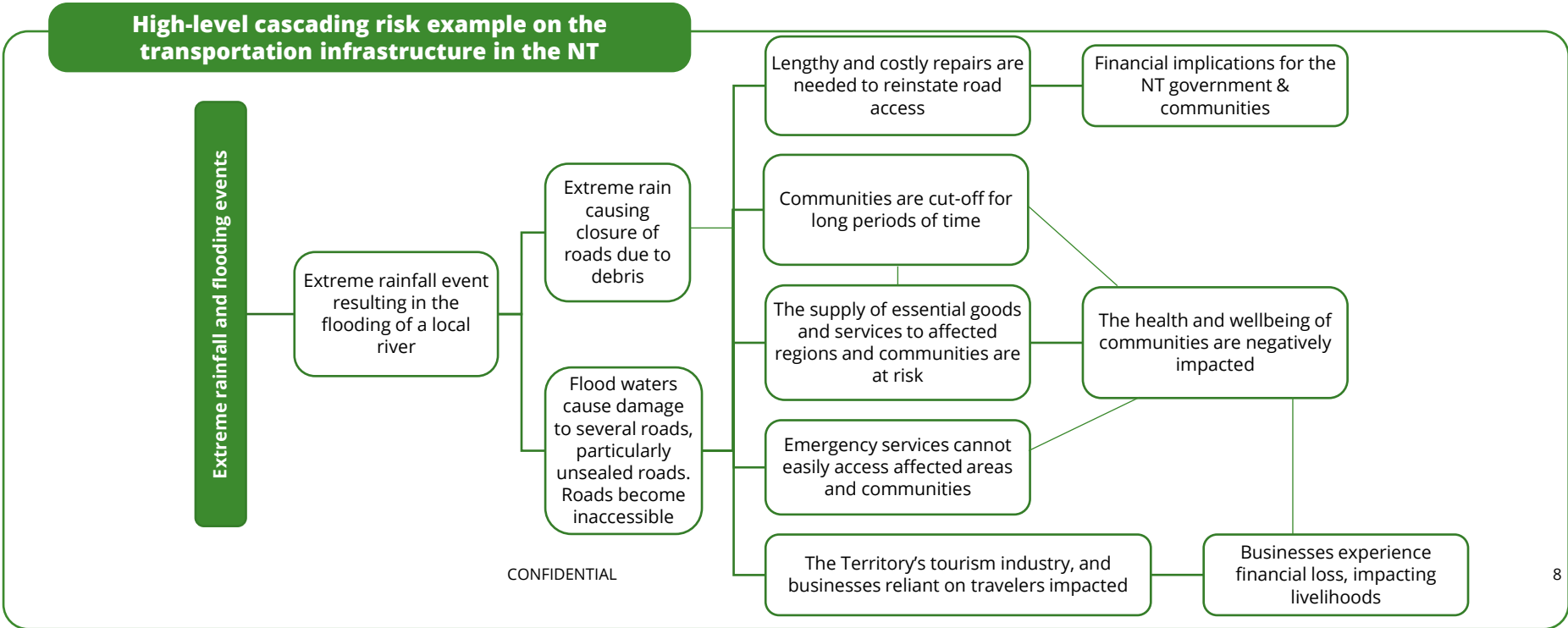
Intersecting and cascading climate-related risks increase impacts and risks to the community health and livelihoods, ecosystems, infrastructure, and economic performance at all levels (as shown on right). Intersecting risks can also generate new sources of vulnerability to climate hazards and compound the overall risk.

It is therefore critical that complex risk is incorporated and considered by climate change risk assessments to ensure that the nuanced risk interactions are better understood, to ensure that the most appropriate adaptation actions are identified and prioritised to address the risks.

As part of the NT CCRA, complex and interacting risks for the Territory were discussed and explored with the cross-agency stakeholders in the risk workshop. An example of such risk associated with extreme rainfall and flooding on the transportation infrastructure in the Northern Territory is provided below.

The NT grapples with the intricate challenge of maintaining robust transport routes and logistics infrastructure across its expansive and remote landscape. The susceptibility of these systems to various disruptions poses a spectrum of risks, each with cascading implications, for example:

- Disruptions to supply chains as essential goods and services may face delays or shortages, impacting communities and businesses.
- Natural disasters or accidents may result in delayed or ineffective emergency responses due to hindered transportation.
- Loss of access to road infrastructure can be detrimental for the Territory's tourism industry, and businesses reliant on travelers.
- Remote communities and areas reliant on transport routes can experience significant isolation if key roads are impacted. This isolating can be devastating to communities, as they may not be able to access healthcare and emergency services and may struggle with food and water shortages. Communities will likely be displaced and will be forced to evacuate. Limited access to transportation options can exacerbate social disparities, hindering opportunities for education, employment, and healthcare.



Overarching recommendations

The below overarching recommendations and key actions are provided to the NT Government to address the climate change risks. These recommendations will support the Northern Territory to implement an adaptive/iterative approach to its adaptation planning ensuring that risk assessments are updated and reviewed at a regular basis and the effective monitoring and evaluation is undertaken. Further detailed and risk specific recommendations are provided in the technical report

Recommendations

Description

High-level actions



Review and update Climate Change Risk Assessment every five years

The NT CCRA should be revisited and reassessed every five years. This will ensure that the latest data, trends, and projections are incorporated into the assessment, providing a more accurate understanding of current and future risks.

- Keep abreast of global and Australian climate change trends.
- Develop a robust monitoring process and review the risks and adaptation actions every five years.
- Consider new scientific research and data sources.
- Compare progress against previous assessments.



Design and implement a cohesive monitoring and evaluation program

Monitoring and evaluation helps to guarantee the enduring success of climate adaptation initiatives, plans and actions.

- Develop and implement a monitoring and evaluation plan/program to support the implementation of the NT CCRA and subsequent adaptation actions and recommendations. These actions could include:
- Use the findings of this first-pass risk assessment and develop a clear set of actions with measurable objectives across government agencies for managing climate change risks across the NT.
 - Select indicators to measure success and progress of climate risk management over time.
 - Based on progress measurement data, the effectiveness of actions should be measured and used to inform any updates to the current approach.
 - The program should be revised and reviewed every five years.



Conduct more detailed and granular climate change risk assessments

More detailed assessments at the liveability measure or risk statement level, is crucial for understanding impacts and vulnerabilities that are crucial to be addressed. Such assessments help identify vulnerable populations and areas disproportionately affected by climate hazards allowing for more tailored and tangible.

- Conduct a more detailed second pass risk assessment focusing on emergency management, identifying the key complex risks associated with an emergency climate event in the Territory to inform future funding and investment in resilience building activities.
- Conduct a more detailed second pass risk assessment focusing on liveability measures relevant to remote regions and communities in the Territory. As part of this assessment the Territory could identify the most vulnerable remote communities to climate risks.
- Incorporate climate change scenarios and risk information in land-use and urban planning processes.
- Incorporate heat mitigation measures in land-use planning, precinct and building designs.



Increase cross-government collaboration & community awareness

Establish a coordinated, multi-agency response to implementing climate adaptation measures across all levels of government. This unified approach will streamline budget planning, minimise resource duplication, enable broad stakeholder engagement and ensure buy-in from key stakeholders and communities.

- Identify opportunities across all levels of government to enhance the coordination of resources targeting climate adaptation. This enhanced collaboration should focus on creating cohesive and efficient strategies for climate adaptation, ensuring that resources are optimally allocated, and initiatives and policy action are complementary.
- Engage with communities to raise awareness of climate change risk in the NT and develop relevant education program.



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