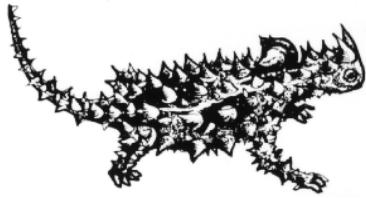


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Climate Change Discussion Paper: Arid Lands Environment Centre Submission

The Arid Lands Environment Centre (ALEC) is central Australia's peak environmental organisation that has been advocating for the protection of nature and ecologically sustainable development of the arid lands since 1980.

Climate change is the biggest global challenge of our time. It presents an existential threat to our economic, political, social and cultural systems by disrupting the environments in which they exist. Responding to this level of change is testing the limits of our regulatory frameworks to protect the environment, human well-being and to provide economic stability.

ALEC welcomes the Northern Territory Government's Climate Change Discussion Paper as a starting point for developing climate policy. Whilst this paper gives a broad overview of climate change and the associated risks, the discussion paper does not give due recognition to the severity of impacts already happening and the urgency of change required.

Key recommendations

- 1. Legislate a Climate Change Act that will develop an enforceable long-term plan to facilitate the transition to low carbon economies.**
- 2. Adopt an initial emissions reduction target of net zero emissions by 2050 to deliver long term certainty across business, government and communities. This target should be implemented through sectoral and interim targets established by an independent expert authority. This target should be periodically reviewed to be consistent with global scientific evidence.**
- 3. Climate change projections and resilience building should be integrated into long-term economic planning for the Northern Territory, such as the *Economic Development Framework*.**
- 4. Review decisions to exploit NT gas reserves, which will significantly raise Australian emissions.**
- 5. Abandon positioning the NT as a 'gas hub'.**
- 6. Review post 2030 renewable energy targets with the view to transitioning to 100% renewable energy.**
- 7. Investigate opportunities in renewable energy export industries.**
- 8. Explore opportunities for low carbon industries including carbon farming.**
- 9. The NT Government releases the draft NT Climate Strategy for public consultation**

Northern Territory – Climate change is already here

The lack of a climate policy for the Northern Territory means that we remain exposed and vulnerable to the worse impacts of these changes that are already well underway.

The Northern Territory is especially vulnerable to the impacts of climate change with a predicted increase in extreme heat days (over 35 degrees Celsius), an increase in the severity of extreme weather events, changes to water availability, and an increase in sea-level rise and extreme sea-

level events. The Northern Territory is already being impacted with increased temperatures, the loss of large swathes of mangroves across the Top End, increased weed spread and changing seasons.

The most marginalised and vulnerable members of our community, including Aboriginal and Torres Strait Islander people, are often the least responsible for ecological risks and threats but will be most affected by their emergence. Anecdotal evidence of the changing climate from some Indigenous communities include noticing changes to weather patterns, “crazy weather”, and bush tucker seasons.

Planning for climate change in the NT

- Climate change ultimately requires a transformational change in political, cultural, social and economic systems
- The legitimacy of NT Climate Policy will be undermined by continued investment in developing fossil fuel industries
- A key objective of the Northern Territory climate strategy must support and enable local and regional adaptation responses
- Opportunities exist for the NT to transition to resilient low carbon economies

Climate planning is critical to addressing the severe impacts projected for the NT. It is estimated that central Australia has already experienced a warming of 1.5°C. Communities and economies of central Australia are particularly vulnerable as a result of pre-existing issues associated with access to and quality of essential services, as well as localised environmental issues such as water scarcity.

While climate change is a direct threat, it is also largely an indirect cumulative risk factor that will exacerbate existing challenges in maintaining liveability and sustainability in the arid zone.

Conventional models of economic growth are driving climate change and will continue to render societies and economies vulnerable.

The legitimacy of meaningful climate action in the Northern Territory is undermined by permitting the development of industries that will cause an exponential growth in NT emissions at a time when we need to be drastically reducing our emissions.

Climate change ultimately requires a transformational change in political, cultural, social and economic systems. The scale of change necessary is not anticipated in the Climate Discussion Paper.

Flawed assumptions inherent in the Discussion Paper include:

- gas as a transition fuel
- the NT needing to grow emissions as a developing economy.

ALEC has raised these issues directly to representatives of the NT government. It became clear these were critical points of contention, which we believe highlight the key barriers to accepting the scale of the problem and committing to meaningful action.

In moving forward, the planning process should prioritise investigating the interactions and linkages between various sectors, industries and institutions. For example, the increase in extreme weather events will likely have an impact on the viability of already seasonal and marginal pastoral operations. Without facilitating a change in financial and logistical networks to manage this vulnerability, the diminished economic productivity of the pastoral estate is likely.

Climate planning should be guided by global developments in technology and information. A key objective of this framework must be to support and enable local and regional mitigation and adaptation responses.

Climate planning must acknowledge that communities and peoples that have contributed the least to climate change stand to be the most severely impacted. The allocation of services and resources to improve a community's resilience should be prioritised according to those most in need. These communities should be enabled to manage the development of suitable responses.

Climate planning must embrace the significant economic and other co-benefits available through developing industries that reduce carbon emissions and improve adaptive capacity and climate resilience.

Mitigation

- Developing an onshore gas industry and growing LNG exports is incompatible with taking action on climate change.
- Allowing emissions to rise has undermined public confidence in the government's commitment on climate action.
- There is significant economic opportunity in growing the renewable energy industry beyond 100%
- Opportunities to diversify the economy through sustainable low carbon enterprises are rapidly developing.

The Northern Territory Government must commit to a net zero emissions target by 2050 with interim sectoral targets.

The global scientific literature is incontrovertible in the conclusion that emissions need to cease growing and ultimately reduce to net zero by 2050 at the latest.¹ The Northern Territory thus has a political, ethical and economic imperative to commit to reducing emissions according to the principle of common but differentiated responsibilities.

The development of an onshore unconventional gas industry and ambitions to further develop LNG exports is incompatible with the Federal Government commitment to reduce greenhouse emissions to prevent a 1.5⁰c rise in global temperatures.

Our understanding of the contribution of methane emissions to climate change is still developing, with recent studies suggesting we are underestimating the role of anthropogenic sources of methane in driving climate change.² The warming potential of LNG production and the process of hydraulic fracturing could be much greater than currently stated. ALEC continues to advocate that the decision to open up the NT to unconventional gas production must be reversed, and fracking must be banned as part of meaningful climate action.

ALEC also questions the emissions projections stated in the graph on page 12 of the Discussion paper, that shows that all sectors emissions plateau beyond 2016, when they are all on an upward trajectory from 2014. We have concerns that the emissions could be much higher than projected for in this graph across all sectors.

The NT Climate Strategy is unlikely to be accepted by the general public and businesses of the Territory without government demonstrating it will lead by accepting responsibility for reducing emissions. Increasing national focus will be directed to the Northern Territory as a climate laggard, effectively undermining climate action in other states and Territories by choosing to increase emissions.

¹ Intergovernmental Panel on Climate Change (IPCC). *IPCC Special Report on Global Warming of 1.5⁰C*.

² John Worden, Anthony Bloom, Sudhanshu Pandey, Zhe Jiang, Helen Worden, Thomas Walker, Hourweling, & Thomas Rockmann, "Reduce biomass burning emissions reconcile conflicting estimates of the post-2006 atmospheric methane budget" (2017) *Nature Communications* 18:2227

Developing renewable energy industries in the NT offers a unique opportunity to grow and diversify economies and improve energy security without increasing greenhouse emissions.

The current renewable target of 50% should be expanded to encourage the production of surplus energy. The Northern Territory is a primary candidate to explore the potential of renewable energy export industries, whether that be through hydrogen or undersea high voltage direct current lines to South East Asia.

The transition towards low and eventually zero carbon economics is technically feasible:

- We can no longer rely on traditional economic models of growth that are highly vulnerable to climatic extremes while entrenching environmental risk.
- Transitioning to sustainable industries could be supported by finance allocated by a fund that is contributed to by large polluters, in a similar way that mining companies contribute to legacy rehabilitation levy.
- The Territory should dedicate research and investment into low carbon enterprises not only in order to reduce global greenhouse emissions, but because continued reliance on unsustainable industries that are being impacted by climate change will undermine future economic and social stability.
- The strategy should develop a post 2030 renewable energy plan to facilitate ongoing growth in renewable energy beyond 50%. This target could exceed 100% to enable the development of renewable export enterprises.
- There is significant economic opportunity in the growth industry of education and training through the development of renewable energy expertise. Key to this could be developing institutional strength in tertiary and engineering capability to export expertise and products.
- Carbon farming has now been firmly established as a reliable economic enterprise that should be further expanded across the NT through committed and sustained funding to indigenous ranger groups. This will provide additional co-benefits as well as carbon sequestration.

Gas is not a transition fuel

- Australian's total fugitive emissions are rising because of the expansion of the LNG export industry
- The premise that natural gas will reduce emissions by displacing more polluting energy sources overseas is unsubstantiated.
- Developing the NT as a gas hub will jeopardise Australian emission reduction efforts.

A central assumption in the discussion paper is that natural gas, including LNG and LPG is a transition fuel that will reduce global emissions by displacing coal. There is no substantive body of research to support this assumption. It is therefore misleading to continue to argue this in support of a gas industry for the NT. The development of natural gas export industries, manufacturing and processing in the NT will increase total global greenhouse emissions.

There are several components of this assumption that need to be corrected in order to clarify the current confusion within the energy debate in Australia.

- The most recent growth in total fugitive emissions in Australian inventories was greater than the decrease in electricity emissions from reduced coal consumption. This is a critical correction that should inform future energy policy: namely that increasing gas production, processing, transport and combustion *has not and will not* reduce Australia's greenhouse emissions.
- There is no conclusive proof that the production and export of NT natural gas will displace coal as an energy source for international or domestic energy production.

- Most Australian natural gas is exported (around 70%) and most of this is being used in Japan to replace the loss in nuclear power capacity, it is therefore dishonest to suggest the east coast will benefit from fracking.³
- The proposals to build import gas terminals on the East Coast to sell Australian gas back to Australians highlights the inequities of an export driven gas market.
- A recent study into the climate change and the global gas market investigated the US LNG exports to Asia and demonstrated that LNG export would most likely increase global greenhouse gas emissions. The paper found no evidence that increasing LNG exports would displace enough coal to cause a net decrease in emissions.⁴
- Offsetting the total increase in emissions from a fracking industry is not scientifically or economically feasible.⁵
- Offsetting the emissions from shale gas development are projected to cost \$143 billion from 2030-2040, completely dwarfing the economic benefits of any gas development.⁶
- Global markets for gas will fall as the world implements the Paris agreement and incorporates the latest IPCC 1.5⁰c report: this will therefore lock in stranded assets for LNG and LPG production and export.
- Developing gas infrastructure will expose the NT Government to liability through litigation and financial action against stranded assets.

Gas will lock in infrastructure that promises continued increases in emissions for decades.

Diversifying the Territory Economy

- Climate change is a significant financial risk through transitional and direct impacts, and early action will be more cost effective
- The argument that developing economies need to increase emissions must be challenged as the global budget diminishes
- Future economic planning for the NT should be informed by climate change projections and prioritise low carbon enterprises.
- There are economic opportunities in renewable technologies such as a hydrogen export industry.
- Carbon sequestration strategies have proven economically viable and provide sustained long-term co-benefits.

ALEC acknowledges the importance of diversifying the NT economy to improve opportunity and wellbeing.

Developing an economy that is dependent on gas production, manufacturing and transport will embed exposure to climate risk, stranded assets and government and corporate entities to the liability of litigation.

The unconventional petroleum industry in the US is proving increasingly non-profitable with a significant portion of companies recording negative cash flows across 2018.⁷ Climate change is now firmly recognised as both a direct and indirect transitional financial risk that corporate entities and regulators must consider.⁸ Transitional risks are those arising from the movement away from enterprises that are highly exposed to climate change impacts.

³ Resources and Energy Quarterly, June 2018:

<https://publications.industry.gov.au/publications/resourcesandenergyquarterlyjune2018/index.html>

⁴ Alexander Gilbert and Benjamin Sovacool. "US Liquefied natural gas (LNG) exports: Boom or bust for the global climate?" *Energy* 141 (2017) 1671-1680

⁵ Mark Ogge, "Options for implementation of Recommendation 9.8 of NT Fracking Inquiry" (2018) *Australia Institute Discussion Paper*.

⁶ Ibid.

⁷ Clark Williams-Derry, Kathy Hipple, "Energy Market Update: Red Flags on U.S. Fracking Disappointing Financial Performance Continues" (2018) *Institute for Energy Economics and Financial Analysis & Sightline Institute*.

⁸ Australia Prudential Regulation Authority <<https://www.apra.gov.au/media-centre/speeches/australias-new-horizon-climate-change-challenges-and-prudential-risk>>

There are multiple options to diversify the economy through sustainable industries that provide economic benefits as well as social and environmental co-benefits. Climate change planning should prioritise nature-based services that will appreciate value with time and improve adaptive capacity.

Globally, there are developing economies that are investing heavily in renewable energy and have committed to significant emissions reductions. Climate planning is a unique opportunity to diversify the economy away from extractive commodity driven growth.

Economic diversification should ultimately embed climate resilience through programs that restore environmental condition and promote industries that encourage environmental stewardship such as carbon sequestration, carbon farming and native plant food industries.

The assertion in the Climate Discussion Paper that “we all depend on economic development to sustain and improve our social and economic wellbeing, but increase economic activity generally leads to increased levels of GHG emissions” is not tenable.

Ultimately, the transition towards new economic models is necessary.

Adaptation Planning

- Adaptation planning will require collaboration and cooperation across many sectors.
- Climate planning should prioritise a comprehensive risk assessment for the NT, especially concerning the most vulnerable and exposed regions and communities.
- Improving adaptive capacity will require short term incremental changes and long-term transformational changes.
- Government should facilitate and support adaptation planning that is culturally appropriate and context specific.
- The government should support the development of a collaborative climate change research institution.

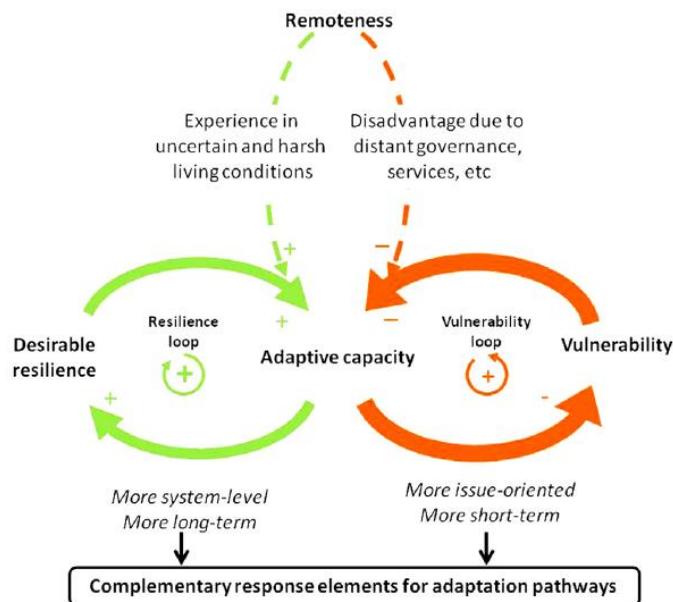
The Northern Territory government has a critical role to play in facilitating adaptive responses to climate change. Government is well placed to design the institutional, market and regulatory mechanisms that support and guide adaptation.⁹ Adaptation planning must involve a collaborative effort across multiple sectors, institutions and communities through an interdisciplinary approach to research and development.

Climate change adaptation is a constantly developing body of knowledge that should be informed by best practice, up to date localised data drawing from a range of resources and strategies.¹⁰

The following figure illustrates how the core principles of adaptation operate, namely: resilience, adaptive capacity, vulnerability and exposure.

⁹ AECOM 2013, “Supporting evidence-based adaptation decision-making in the Northern Territory: A synthesis of climate change adaptation research, National Climate Change Adaptation Research Facility, Gold Coast, 94 pp.

¹⁰ <<https://www.nccarf.edu.au/>>



Feedback loops on desirable resilience and vulnerability responses in remote communities. Taken from Maru et al 2014.

The following are some strategies to inform adaptation planning that is equitable, inclusive and culturally appropriate.

- Guidelines for increasing adaptive capacity and reducing vulnerability will take a comprehensive and holistic approach to research, monitoring and adaptive feedback processes.
- Establish the NT as a climate change adaptation innovator, demonstrating the possibilities of adaptation planning in arid and tropical zones which could have global significance.
- Each sector or community should be supported to build adaptive capacity on their own terms. The role of Government will be to facilitate the transition by providing capability to implement adaptive responses.
- Adaptation should be differentiated into incremental and transformational changes. For example: more cycling signage on roads to encourage cycling as compared to transforming the industrial relations system so that working hours change to reduce the health risks of extreme heat.
- Commit considerable financial support to developing climate change research capability across key sectors and institutions.
- Undertake a comprehensive assessment of the scale and magnitude of risk posed by climate change to the Northern Territory: in the absence of this knowledge it will be difficult for communities and organisations to adapt.
- Planning will need to be proactive in order to be effective in mitigating the worst impacts over the long term. This will require working beyond the normal short-term policy planning cycles.

There is not yet a significant body of research that has been conducted into the ways remote and very remote communities will be impacted by climate change. Adaptation for remote and very remote communities must be developed through proper engagement, ensuring these communities are able to determine the scope and direction of adaptation. A research priority should be investigating the ways in which people have responded to historical changes to understand inherent resilience.

There are several important considerations in developing appropriate adaptation policy:

- Pre-existing vulnerabilities that need to be understood in order to frame adaptation strategies over the coming decades.

- Acknowledge that while there are significant vulnerability issues and generally high exposure, remote communities may also be highly resilient to climatic extremes and environmental change because of adaptation to resource scarcity and variability.¹¹
- Remote inland communities are likely to experience a greater level of warming than coastal and regional centres.

Significant and long-term structural reforms will be necessary to maintain the economic viability of the Territory and continue to provide for livelihoods of all living in the NT.¹²

The total number of days over 35⁰c in Alice Springs are projected to rise significantly by 2070. This will require a radical redesigning of the urban zones to ensure it remains liveable.

One significant method of adapting to this warming that is already being employed to a degree is increasing total vegetation cover in urban areas. Tree plantings are a proven method of reducing temperatures in regional centres. The cooling effect of vegetation is most effective during extreme heat events and at the hottest temperatures in the day.

Legislatively mandated urban canopy targets could be introduced through the Planning Scheme, Planning Act or local government plans. Tree species selection should be informed by a consideration of cultural, political and legal factors. Vegetation targets could be achieved through a strategic approach to implementation that will require long term planning. This approach could also consider additional benefits such as bush food species and amenity while also minimising fire risk. Adaptation will therefore require planning reform to ensure an increase to total green cover in urban areas.¹³

Planning guidelines should be entirely reviewed so that they provide for energy efficient design and passive heating and cooling. Climate change suitable design should be incorporated into urban architectural guidelines.

Land Management and caring for country

- Supporting communities to stay on country and care for country is one of the most effective ways to improve adaptive capacity.
- Indigenous ranger programs should be expanded and supported with committed long-term funding through carbon farming and invasive weed management.
- The Pastoral estate is vulnerable to the impacts of climate change and needs to be supported to implement more sustainable land management techniques.
- Improving grazing methods and pastoral reform should become a research priority to improve carbon sequestration potential, improve land condition and reduce methane emissions.

The management, conservation and use of the land mass of the NT is fundamental to successful climate planning. Emissions from LULUCF are disproportionately significant compared to other Australian jurisdictions and should therefore be a focus of climate policy.

A key priority for climate planning should be on investigating ways to reduce emissions from LULUCF and pastoral activities as well as encouraging more sustainable methods of primary production. Caring for country and supporting Aboriginal people to stay on country is also fundamental to explore the carbon sequestration opportunity and improve adaptive capacity.

¹¹ Yeheyis Maru, Mark Stafford Smith, Ashley Sparrow, Patricia Pinho, Opha Dube, “A linked vulnerability and resilience framework for adaptation pathways in remote disadvantaged communities” (2014) *Global Environmental Change* 28: 337-350.

¹² NCCARF, Policy Information Brief: Climate-adaptive northern development
<https://www.nccarf.edu.au/sites/default/files/attached_files/Northern_Development_PGB_WEB.pdf>

¹³ Cooling remote Australian communities with vegetation; Findings from Alice Springs

Indigenous ranger programs have proven highly successful in delivering environmental outcomes while also improving economic opportunity and enabling the maintenance of cultural responsibilities. Demand for these programs currently surpasses supply. They are also undermined by short term funding arrangements and no commitment beyond 2020. These programs have already demonstrated significant carbon sequestration opportunities, improved biodiversity outcomes and generally enabling caring for country across a vast area of land that requires ongoing management and protection.

This climate policy should outline a process for ensuring long term committed funding to expand ranger programs across the NT.

Strategies to improve adaptive capacity and resilience across Aboriginal owned land include:

- Keeping people on country to maintain Aboriginal systems of governance.
- Maintaining cultural practices of caring for country such as seasonal burning, biodiversity conservation and management of invasive species.
- Support Aboriginal driven enterprise development such as bush foods and bush medicine industries.
- Provide capacity support through finance and regulations for those enterprises and develop market opportunities.
- Expand the *Land Management Conservation Fund* and include the Central Land Council and other Aboriginal organisations in the advisory committee to ensure that those funds support Aboriginal land management priorities.
- Developing a carbon methodology for rangelands and areas receiving less than 600mm of rainfall should be a key research priority.

There are promising developments on the pastoral estate in alternative grazing methods that demonstrate positive biodiversity outcomes, carbon sequestration potential and generally improved land condition.

Coodardie and Woodgreen Stations are two examples of non-conventional forms of grazing that maintain dynamic environmental systems. These methods have greater capacity to preserve biodiversity and encourage carbon sequestration through soil protection. Holistic and rotational grazing methods have shown positive outcomes in higher rainfall zones but there is still a lot of research that needs to be done to verify these claims and demonstrate its potential in the arid zone. Maximum stocking rates should be revised according to the climate change projections for the rangelands. Climate change is projected to significantly impact productivity of the pastoral estate by as much as 20%, and this should be acknowledged as both an environmental and economic risk.¹⁴

Pastoralists should be supported to diversify their activities through conservation covenants and sequestration activities as well as provided with information on how to adapt their operations.¹⁵ This will require a complete revision of the Pastoral regulatory framework including a review of the *Pastoral Land Act* to incorporate climate change planning. Planning for the pastoral estate under climate change is therefore not just sound climate policy but responsible economic policy.

The cattle industry is now expected to be responsive to consumer demands of improving the sustainability of the industry through reducing total greenhouse emissions. Meat and Livestock Australia have committed to carbon neutral operations by 2030.

Government should provide scientific support to develop methane mitigation strategies for the pastoral industry and provide the monitoring and research capacity to verify claims of carbon neutrality.

¹⁴ Factsheet 1: NT Pastoral Industry and Climate Change Overview: NTG 2008
<<http://www.territorystories.nt.gov.au/jspui/bitstream/10070/230441/1/CCFS01.pdf>>

¹⁵ Bastin G, Stokes C, Green D and Forrest K, “Australian rangelands and climate change – pastoral production and adaptation” (2014) *Ninti One and CSIRO*, Alice Springs.

Primary industries and fisheries

- Primary industries are highly exposed to climate change and should be supported to diversify with climate resilient crops.
- There is a wealth of research already undertaken that should be built upon to reform the pastoral estate with a view to becoming carbon neutral by 2030.

Previous NT Government studies identified a risk of reduced productivity of the pastoral estate by up to 20% because of climate change.¹⁶

An additional risk for pastoral activities is that in order to adapt to increasing temperatures, adding watering points will increase the total environmental pressures of grazing. It is widely acknowledged that land degradation on stations is greatest around watering points. This is an example of the need to identify those indirect impacts of adaptation that have flow on environmental risks.

Pastoral enterprises are being increasingly contested over issues such as animal welfare, attitudes to private land conservation and invasive plant species. These are all impacted by climate change and will need to be addressed in adaptation planning. Factsheets on the pastoral industry from the government in 2008 shows the importance of building on existing knowledge.¹⁷

The stress on primary industries from climate change offers an opportunity to improve economic stability through diversifying activities.

Pastoral enterprises should:

- Consider alternatives to large scale grazing using more sustainable and resilient protein sources such as kangaroo.
- Anticipate the very real possibility that already marginal land will become unproductive: some regions will no longer be appropriate for grazing.
- No strategies will be effective in isolation; industries will need to develop a systemic approach to managing land in a highly variable climate that will become more variable and extreme.
- Develop holistic reviews of processes for determining stocking rates that accommodate longer-term projections under climate change.¹⁸
- Support strengthened investment in small scale sustainable horticulture, especially if diversification of the pastoral estate or indigenous owned land is supported by local land owners. This will also improve food security which will be impacted by climate change.

Biodiversity and ecosystems

- Climate change will be a key driver of species extinction in the NT without improved management.
- Improving private land conservation and linking extended wildlife corridors is integral to improving biodiversity resilience.

In the Discussion Paper there are several additional impacts that weren't acknowledged and need to be highlighted:

- Extinctions: several species are on the verge of extinction and climate is a threat multiplier. Climate change is projected to become one of the greatest drivers of extinction as it places additional stress on populations already vulnerable from pre-existing land use pressures.

¹⁶ <http://www.nintione.com.au/resource/DKCRC-Working-Paper-54_CAGSP-Woodgreen-Station-NT.pdf>

¹⁷ <http://www.nintione.com.au/resource/DKCRC-Working-Paper-54_CAGSP-Woodgreen-Station-NT.pdf>

¹⁸ Basin G, Stokes C, Green D and Forrest K (2014) "Australian rangelands and climate change – pastoral production and adaptation", *Ninti One Limited and CSIRO*, Alice Springs.

- Tree die backs: mangrove die back is well documented in the Top End and there is growing awareness of die back for other species in the tropics such as Melaleuca and estuarine Eucalypts.
- Homogenisation of landscapes as a result of changed fire regimes. This will reduce genetic diversity and increase threats to biodiversity.
- Reduced availability of native plant foods which add to the barriers of remaining on homelands.

Improving the adaptive capacity of landscapes to reduce total biodiversity stressors will require innovation in conservation strategies across land tenures and jurisdictions.

Private land conservation is an emerging area of interest that has a lot of potential to increase the total area of land under conservation agreements. Linking habitat corridors, conservation reserves and national parks is a key adaptation strategy.

Other strategies for improving resilience in landscapes to improve native plant and animal resilience are:

- Recommit to planning the Territory eco link in collaboration with the South Australian Government. This work is consistent with objectives of the SA and NT Strategic Partnership Agreement.
- Establish a legal process to facilitate cooperation across different land tenures to develop eco links and prevent habitat fragmentation.
- Initiate climate planning across all organisations and sectors with land use management responsibilities.
- Create incentives to encourage restoration of environmental condition across the NT through developing a land condition assessment for the various bioregions of the NT. This should inform land use planning with a focus on improving adaptive capacity.

Conservation activity and maintained habitat connectivity primarily occurs on Aboriginal land. The benefit of on country management to both carbon sequestration and biodiversity conservation are critical to addressing climate change. Aboriginal land must continue to be managed according to the interests and governance of the appropriate custodians, ensuring that those communities are in control of the terms of this management. Any benefit arising from indigenous ecological knowledge and management should be mutually beneficial.

Wellbeing

- Adaptation planning should develop comprehensive vulnerability assessments through engagement of the most vulnerable communities.
- Climate change will exacerbate ongoing issues of poor access to essential services, dispossession of land and health inequality.
- Climate justice should be a core objective of climate policy.

Indigenous communities are not more likely to be negatively impacted because of close relationship and dependence on the land, as suggested in the Discussion Paper, but because the changes will exacerbate pre-existing vulnerabilities.

However, it is important to not assume only vulnerabilities and overlook the resilience and strengths of these communities. Communities should be supported to determine vulnerability assessments according to local issues and perspectives.

Climate change is a cumulative risk factor for communities where there is already heightened exposure to risk and limited adaptive capacity. This is primarily because of poor access to essential services, poor infrastructure, barriers to staying on country, dispossession from land and generally lower standards of wellbeing.

Remote communities have higher proportions of young people whom are more vulnerable to the impacts of climate change. It is important to emphasise that *climate justice* should inform our response to mitigation and adaptation. Climate justice should be incorporated as a key principle of climate planning.

Implementation

- The NT Government must legislate a climate change act that creates an enforceable whole of government approach to mitigation and adaptation.
- Introduce a new set of policy objectives and an updated set of guiding principles to embed climate change in government decision making
- Climate triggers should be implemented in environmental assessment decisions.

Climate planning will require a cultural shift to ensure commitment across the NT well into the future. Climate change planning will be most effective once it is legislated and incorporated across all aspects of government planning and decision-making.

Climate planning should be implemented through an enforceable whole of government legislated framework.

While there is a place for voluntary programs, emissions targets and adaptation actions should ultimately be enforced by legal mechanisms to ensure reform is effective and implemented in a timely manner. Economic plans, regional planning documents and policy visions should integrate the latest climate projections to ensure future planning is guided by climate considerations.

The framework should outline a mechanism for collaborating relevant information, data and research across the NT to inform adaptation planning. For example, climate data recorded by mining companies and methane emission investigations through GISERA should be constantly fed into decision making processes across government.

There is opportunity in invigorating the NT as a knowledge and innovation hub that promotes climate research as a core tertiary research priority. There is a legacy of robust and reliable research in the arid zone that should be built upon and revived through cooperative research centres.

A Northern Territory Climate Change Act should:

- Establish long-term emissions reduction targets of net zero by 2050 and include interim targets with periodic compliance reporting.
- Introduce a clear agenda of policy objectives and guiding principles to embed climate change across all levels of government decision making.
- Establish a process for reviewing climate action every five years including a process to meet targets.
- Develop adaptation action plans for key systems and communities most vulnerable to the impacts of climate change.
- Establish a system of regular reporting to ensure planning is transparent, accountable and that there is ample opportunity for public participation.
- Introduce a climate trigger for relevant decision making, especially regarding land clearing.

Conclusion

The release of the Northern Territory Government Climate Change Discussion Paper is an important step in the process of developing an effective and meaningful Climate Strategy.

It is crucial Territorians understand the risks posed by climate change and tailored strategies must be developed - with extensive stakeholder engagement - to reduce the risks and optimise the co-benefits.

It is also crucial that the NT Government leads action on climate change, adopts emission reduction targets and facilitates adaptation planning. Deep and rapid emissions reductions targets are required across all sectors and at all levels, and communities be supported to prepare for climate change impacts.

The NT Government must lead the necessary transition towards sustainable, low carbon and climate resilient futures. This will involve reframing the economic aspirations of the NT to develop sustainable low carbon enterprises and committing to community based, interdisciplinary approaches to adaptation that builds adaptive capacity and resilience over the long term as the climate changes.

ALEC continues to advocate against the development of an unconventional gas industry in the NT, which has the potential to increase Australian emissions significantly.