

# Progressing Climate Change Adaptation in the Far North Through Community Resilience

Allan Dale, Professor of Tropical Regional Development, The Cairns Institute,  
James Cook University

Karen Vella, Senior Lecturer in Planning Science and Engineering Faculty,  
Queensland University of Technology

Ruth Potts, Queensland University of Technology

# The Project

---

## 2014 Social Resilience Benchmarking in the Northern Gulf region

This consultancy funded by the Northern Gulf Resource Management Group updates and expands upon the existing social resilience benchmarking with the most current and best available data and evidence, providing a current assessment of the social resilience of Gulf Communities against a set of prescribed indicators, with reference to climate change drivers.



# What The Project is About



PHOTO: Ray Ladlow walks to his destroyed home in Silkwood, south of Innisfail, March 21, 2006, after Cyclone Larry downed thousands of kilometres of power lines across north Queensland. (Dave Hunt: AAP)



PHOTO: Anne Fitzpatrick surveys roadside damage in the wake of Cyclone Larry in Innisfail on March 23, 2006. (Steve Brennan: AAP)

- Post, Larry, 2009 floods, Yasi and recent droughts and extensive fires, people in the Gulf understand that the region needs to be more resilient to disasters.
- Other factors equally require the community to build such resilience: live cattle ban, BSE, policy uncertainty on ag development, etc.
- The scientific agreement that potential climate change impacts for the Gulf may mean deeper dries, more intense floods, stronger cyclones and sea level rise.

# How We Want to Do This



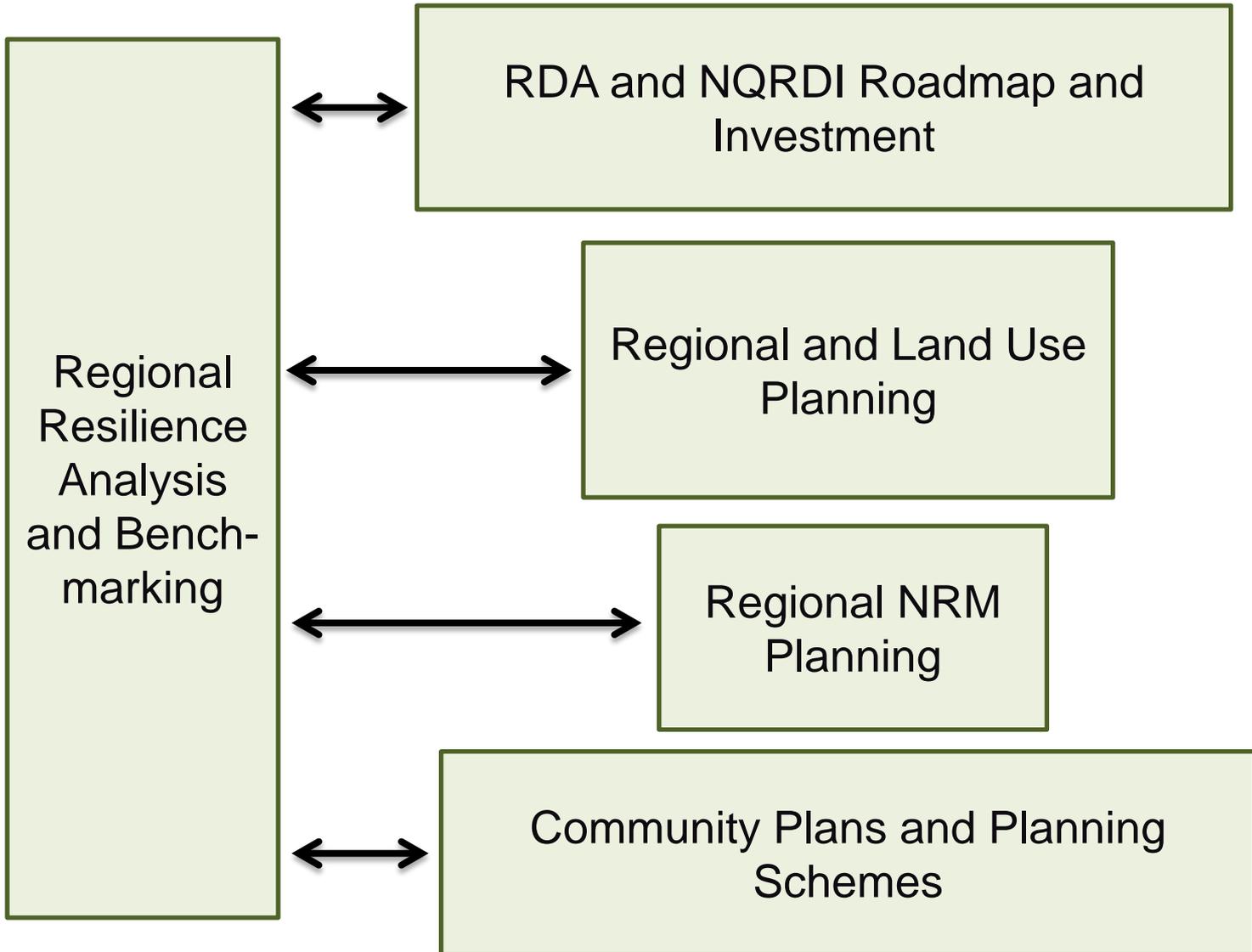
PHOTO: ABC <http://www.abc.net.au/news/2013-05-28/aerial-view-of-gulf-of-carpenteria/4716642>



PHOTO: Kowanyama, Queensland, Australia  
<https://www.flickr.com/photos/feralarts/4399065289/in/photostream/>

- We all know Government needs a compelling case and evidence to act or to allocate resources to big problems.
- We want to support the Gulf region to develop these responses and support key players with the required evidence.
- Allows us to support the key players seeking change, including Councils, Northern Gulf NRM, GSD and RDA FNQ&TS.
- Currently, RDA working towards regular budget negotiation on regional adaptation with both State and Commonwealth.

# How Things Can Fit Together



## Reminder of Key Climate Risks

---



PHOTO: Jeannie Fletcher <https://flic.kr/p/uqNjk/>

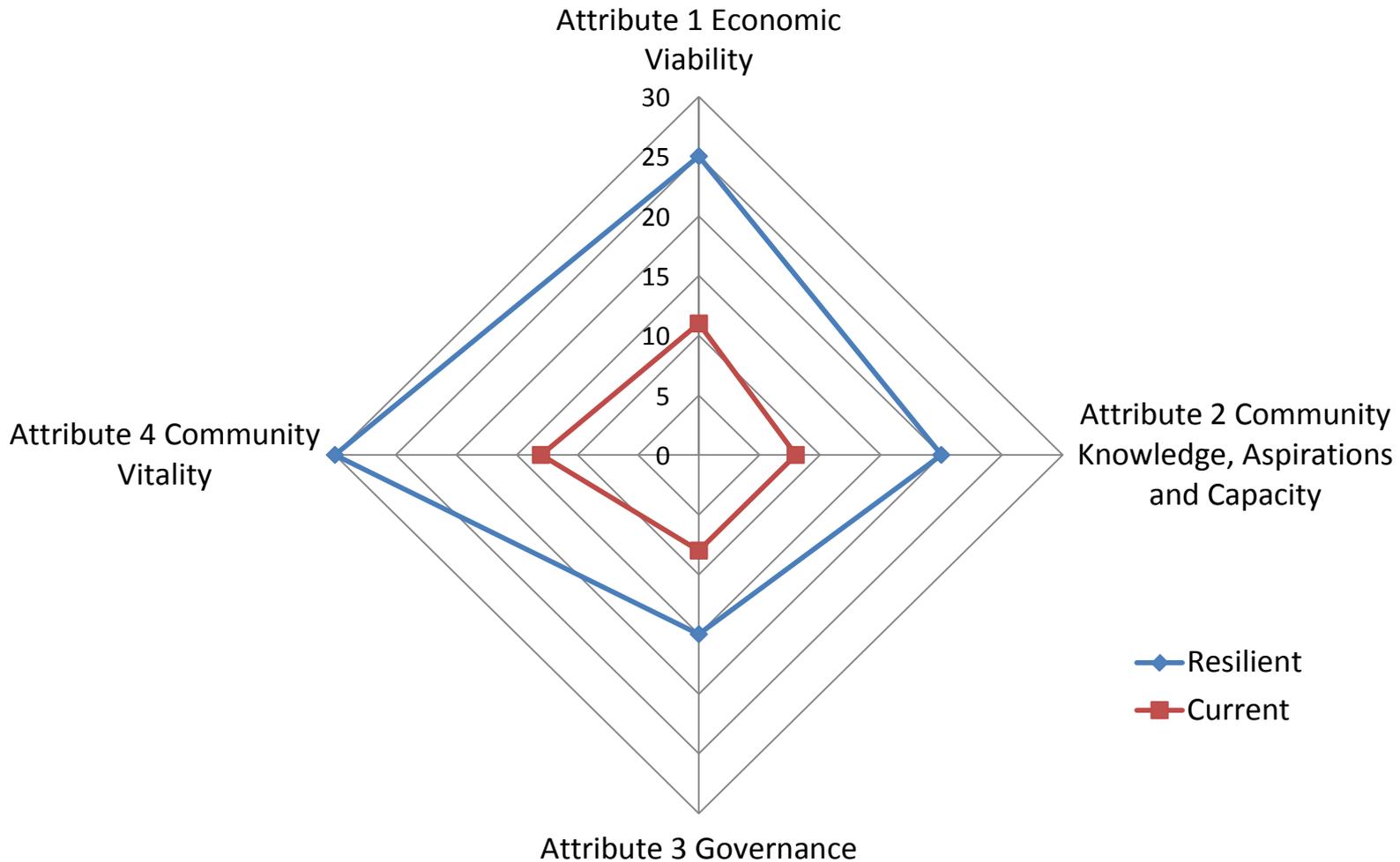


PHOTO: Dan Rosendahl <https://flic.kr/p/4WrDGX>

- Annual temperature increases/ evaporation.
- Higher frequency of more intense cyclones/ storm surges.
- More extreme rainfall events.
- Deeper dry-season droughts.
- Biodiversity loss in the system.
- Sea level rises and fisheries impacts.
- Pest and fire regime changes.

# Resilience Rating Scale

Index Rating	Decision Rule
5	The relevant community will easily mitigate and adapt to the most severe impacts of climate change and extreme climatic events, maintaining or improving their economic and social wellbeing and the health of their natural resource base over time.
4	The relevant community will make some progress on mitigation and accommodate the most severe impacts of climate change and extreme climatic events, maintaining their economic and social wellbeing and the health of their natural resource base over time.
3	The relevant community will suffer some shocks associated with the most severe impacts of climate change and extreme climatic events, taking considerable time and investment to adjust to secure their economic and social wellbeing and natural resource base.
2	The relevant community will be seriously impacted by the most significant impacts of climate change and extreme climatic events, resulting in declining social and economic wellbeing and natural resource health.
1	The relevant community will be irreversibly impacted by the most severe impacts of climate change and extreme climatic events, with both social and economic wellbeing and natural resource health unlikely to recover.



## 1.1 Economic Viability - Diversity

---



PHOTO: Queensland Country Life [www.queenslandcountrylife.com.au/](http://www.queenslandcountrylife.com.au/)

- High debt levels in the pastoral sector but some confidence returning via live cattle.
- Little movement in the mining sector and Kagara collapse.
- Emerging NQ Irrigation Strategy (and Northern White Paper) promising for medium scale farming innovators, though also current risk of Panama disease.
- Ever-so-slight improvements in the window for tourism/recreation.
- Still long way off an ecosystem services economy.
- Cumulative impact of Marine and Coastal Reserves.

## 2.5 - No Change

## 1.2 Economic Viability – Natural Resource Base

---



PHOTO: Michael Jefferies <https://flic.kr/p/5ngfxk/>

- Tourism depends on access/quality experience.
- Water availability is seasonal though now potential for reasonable allocation and development.
- Gulf fisheries progressing towards industry sustainability but competition with conservation/recreation.
- Pasture condition and trend was static but problematic.
- Increased pest/ferals, weeds, fire and erosion risks.
- Potential for environmental services markets.
- Food security is still vulnerable due to freight.
- Sustainable energy supply on the increase.

## 3.0 - No Change

## 1.3 Economic Viability – Economic Equality

---



PHOTO: Rob and Stephanie Levy | Fair Dinkum Bloke in Chillagoe | <https://flic.kr/p/2fjbHC>

- 40.3% of individuals earn less than \$400/wk cf 20%.
- Some 47.5% post-school qualification (cf 50.4%).
- Some 94.5% small businesses.
- Less transience - 16.9% cf. 19.7% one year figures.
- Many residents living below the poverty line.
- Region has some vulnerable populations.
- Most travel for higher education.
- Additional vulnerabilities in major events (particularly floods).
- Strong welfare reliance, low skills, lower education, low income, low levels of home ownership.

## 2.0 – Change from 2.5

# 1.4 Economic Viability – Workforce and Participation



PHOTO: ccdoth1 | Komatsu 830E | <https://flic.kr/p/5xFBYS>

- Carpentaria, Croydon, Etheridge 15.2% cf 5.5%.
- Agriculture, Forestry, Fishing (15.6%), Retail Trade (11.2%), Health Care and Social Assistance (9.4%).
- Some opportunities in the emerging industries.
- Primary industries employment affected by cyclones and farm scale debt/ investment uncertainty.
- Century Mine closure will have region wide impacts.

## 2.5 – Change from 3.0

## 1.5 Economic Viability – Investment Confidence

---



PHOTO: Graham Cook | Longreach cattle property |  
<https://flic.kr/p/fpzZT8>

- Investment confidence in the pastoral, renewable energy, mining and fishing (and tourism) sectors low.
- Growing farm debt levels of significant concern.
- Increasing interest (national and international) in water and mining and policy improvements may enhance live cattle, but significant investment uncertainty remains.
- Concerns regarding impact of political and policy instability.

## 2.0 – Change from 3.0

## 1.6 Economic Viability – Economic Infrastructure

---



PHOTO: dirtymouse | <https://flic.kr/p/7kGc6>

- Road transport assets are progressively improving but also increasing pressure.
- Expensive air transport important for freight/passenger travel.
- Discussion on exploring potential water infrastructure.
- Transport infrastructure vulnerability in more severe events.
- Increased freight and product costs if roads are flooded more frequently/fuel prices continue to rise.
- Farm assets and stock vulnerable to more intense events.
- NDRRA funding models not well suited to betterment and Productivity Commission report may have implications.
- Potential for major port disruption is there but not realized (and no rail systems).
- Regional housing stock vulnerable to intense cyclones.
- ICT infrastructure in the region still very limited

## 3.0 – No Change

## 2.1 Community Knowledge and Capacity - Climate Awareness

---



PHOTO: Kyle Taylor | <https://flic.kr/p/8qv3N2>

- Post Yasi and 2010 floods and droughts, Gulf communities have a heightened awareness.
- Broad NRM awareness raising activities.
- Ag profiles of 'Cash poor long-term adaptors' (55% of sample), 'Comfortable non-adaptors' (26%) and 'Transitioners' (19%) (Hogan et al. 2011).
- Post disaster awareness varied but aroused.
- Increasing evidence of pastoral sector awareness and also awareness in schooling outcomes.

## 4.0 – No Change

## 2.2. Community Knowledge and Capacity - Education and Knowledge Spread



PHOTO: John Skewes | Ravenswood 2013| <https://flic.kr/p/dTYA5N>

- School and post-school education below Qld Average and limited vision for careers.
- Some 78.7% students attending govt schools.
- Some towns have no primary schools and limited services.
- No secondary education beyond Year 10, and major impact with Yr 7 now in High School.
- Lower formal skills balanced by strong practical and traditional knowledge levels.
- School curriculums do not fully take into account futuring/planning and relevant skills.
- Increasing evidence of pastoral sector awareness and schooling outcomes.

### 2.0 – No Change

## 2.3 Community Knowledge and Capacity - Skills Spread



PHOTO: Mining Australia | [www.miningaustralia.com.au/](http://www.miningaustralia.com.au/)

- Skills shortage and lack of education or training facilities, particularly in business succession. Seasonality poorly addressed.
- Significant emigration of youth towards cities, though some vocational training improve.
- Broad shortage of ‘most professionals’.
- There is a need to re-skill and increase business resilience.
- Skilled workers often brought into the region in short term or fly in-fly out arrangements.
- Very hard to retain permanent skilled staff.
- Some increase in financial services in the pastoral sector.

## 2.0 – No Change

## 2.4 Community Knowledge and Capacity - Leadership Capacity

---



PHOTO: Matthew Kenwick | Cairns | <https://flic.kr/p/eU8XX4>

- Leaders for solving complex problems emerging in Local govt and not-for-profits.
- Regional leadership does exist across the community and different industry sectors.
- External problems increasingly being responded to with a more cohesive leadership.
- Greater cross collaboration emerging within the wider FNQROC framework.
- New crop of regional leaders settling in.

4.0 – No Change.

## 2.5 Community Knowledge and Capacity - Cultural Integrity

---



PHOTO: feral arts | Mitchell River delta | <https://flic.kr/p/9oJX15>

- The Gulf region continues to have strong and distinct cultural integrity around key communities/industries.
- Some aspects of long standing cultures, however, may result in some resistance to change.

## 4.0 – New component

## 3.1 Community Vitality - Demographic Stability

---



PHOTO: Michael Coghlan | Swimming hole | <https://flic.kr/p/ef9ec9>

- The average annual growth rate in the estimated resident population of the Northern Gulf Region was 1.2% between 2001 and 2013 and 1.1% between 2011 and 2013.
- Most of the population in the Northern Gulf is in the 45-64 (27.9%), 25-44 (26.1%), and 0-14 (19.9%) age groups.
- In the Northern Gulf some 18.7% are Indigenous. The average for all of Queensland is 3.6%.
- Demographics generally stable.

## 3.5 – No Change

## 3.2 Community Vitality - Wellbeing/Happiness

---



PHOTO: Australian Dept of Defence | <https://flic.kr/p/9bWa9w>

- Higher satisfaction with life, particularly with safety and feeling part of the community, and more willing to help each other, compared with urban and rural areas.
- Post recent disasters and high debt level, the general community may be more vulnerable and prone to depression, suicide risk and have lowered resilience to change when there is a lack of adequate support networks.
- High cost of multiple disasters and policy failures now starting to show (with reported shift from angst to anger).

## 2.5 – Change from 3.0

## 3.3 Community Vitality - Health Disparities



PHOTO: Jez | Queensland Country Ambulance | <https://flic.kr/p/FiwPi>

- People in remote areas are more likely to die from lung cancer, CHD, stroke, suicide, injury, poisoning, road traffic injury, diabetes, asthma.
- Higher death and hospitalisation rates (alcohol & tobacco) and Ice now impacting.
- The rate of suicide indicates that there is a high prevalence of mental health issues and limited services.
- Highest levels of distress and functional impairment were reported in those permanently unable to work.
- While health is not bad in an international context, there are significant internal disparities.

## 2.0 – No Change

## 3.4 Community Vitality - Services and Accessibility



PHOTO: Fiona Henderson | Mango madness | <https://flic.kr/p/axEtUE>

- Aged care, child care, hospital services significantly lower than numbers across Queensland.
- Data about services not benchmarked across community.
- Accessibility to services is poorer than metropolitan areas.
- Short-term food security and availability of fresh produce after major weather events.
- General regional disparity has been exacerbated by the farm debt crisis and service centralization. This suggests a need for cautious approach to improving servicing.

2.0 – No Change

## 3.5 Community Vitality - Housing and Accessibility



PHOTO: Normanton | realestate.com.au

- Cheap land but housing stress is a problem in attracting services and staff.
- Access to services (particularly aged care) poor/weaker than metropolitan areas.
- High vulnerability to petrol shortages when main access roads are closed.
- Public transport availability poor if at all.
- A large discrepancy in quantity and value of housing between different areas. Efforts to improve housing accessibility are needed in areas such as Croydon, Etheridge, and Kowanyama.

2.0 – No Change

## 3.6 Community Vitality - Risk and Risk Management



PHOTO: srv007 | Assembly Point | <https://flic.kr/p/dSi1yk>

- Communities know what to do in extreme events, but coordination shift from Mareeba to Cairns may weaken the response strength.
- Strong disaster preparedness and response mechanisms in place though require improved information flows.
- Many insurers limit flood coverage in policies. Cyclones generally fully covered by most insurers and post Yasi some insurers increased premiums by up to 300%.
- Government NDRRA are relatively centralised, bureaucratic and inflexible and Exceptional Circumstances policy change.
- Community/safety issues associated with crime are of less importance than other areas.

## 2.5 – No Change

## 4.1 Governance - Structural Integrity of Regional Governance System

---



PHOTO: Cameron Galipo | Sugar Cane | <https://flic.kr/p/2X3H65>

- Structural integrity of NRM and economic sectors are currently reasonable but stable.
- Structural integrity of the human services sector weak with the exception of primary health care, policing and school-based education systems.
- Strong linkages between all sectors and wider Regional Development Australia framework.
- Regional land use planning and infrastructure planning is particularly weak.

### 3.0 – New component

## 4.2 Governance - Connectivity

---



PHOTO: Francisco Martins | Paddock | <https://flic.kr/p/aeMTAZ>

- Some transitional weakening in connectivity between NRM body, TOs, human service sector, Local Govt and industry.
- Poor linkages between Councils now improving and integrating within FNQ ROC/ GSD approach.
- Connections increasingly made between Councils, Industry in the NQRDI and Water Allocation.
- Clear connection between regional interests and higher lever RDA regional and cross regional strategic interests.
- Traditionally strong linkages to science community severed by changes in funding models but re-emerging.
- Connectivity across regional institutions may have been delayed due to extensive leadership changes.

## 3.0 – No Change



## 4.4 Governance - Knowledge Use

---



PHOTO: Feral arts | Kowanyama Lands Office Rangers |  
<https://flic.kr/p/7GP7uG>

- While there are data limits reasonably high capacity of access and use a wide range of data.
- Science effort and coordination has declined but may also not improve under new NESP arrangements.
- NGRMG has been progressively developing long term resource condition monitoring and reporting frameworks.
- Strong regional respect for traditional/historical knowledge.
- Economic/social data weak but can track short term change.
- Currently limited use of effective decision support tools.
- Strong regional beef extension frameworks.

## 3.0 – No Change

# High Strategic Priorities?

---



PHOTO: The \$2 billion plan will use 500,000 megalitres of Einasleigh river water. (ABC News: Peter Lewis)

- Farm debt tax write-down and longer term small business adjustment capacity and servicing.
- Major NDRRA over-haul and reforming our relations with the insurance industry.
- Core increase in regional strategic capacity of Human Services Sector.
- Serious water supply strategy development on back of the Gulf Water Resource Planning process.
- Progressive priorities in Gulf, Kennedy-Hann/Gregory Highways and Gulf Development Roads and expansion of Roads Alliance.
- Priority for ICT services reform.

## Emerging Strategic Priorities?

---

- Coastal and infrastructure risk assessment (flood, storm surge, emergency evacuation) and next generation regional plans and planning schemes.
- Major focus on greater energy independence and development coordination of local energy.



# Emerging Strategic Priorities?

---



PHOTO: Courier Mail | [www.couriermail.com.au](http://www.couriermail.com.au)

- Gulf RADAR installations.
- Information alliance to underpin property scale knowledge on flood risk and emergency response.
- Recasting the NESP Investment model.
- Collaborative growNorth alliance.
- Bio-regional planning and associated ecosystem services analysis.

## Next Steps?

---

- Progress High Priority and Emerging Strategies.
- Coordinate support behind strategy development and implementation.
- Profiles can continue to be refined and fed direct in the regional NRM planning process.
- RDA support for negotiation of a regional climate adaptation package with State/ Federal Govts.



PHOTO: Cameron Galipo | Golden Hour | <https://flic.kr/p/3onS5h>

# THE CAIRNS INSTITUTE

Research in tropical societies



## Contact

Professor Allan Dale  
The Cairns Institute  
James Cook University  
PO Box 6811 Cairns  
AUSTRALIA 4870

[allan.dale@jcu.edu.au](mailto:allan.dale@jcu.edu.au)

+61 7 423 22129

M: 0418 736 422

[twitter.com/DevInTropics](https://twitter.com/DevInTropics)