FINAL REPORT—Executive Summary

Great Barrier Reef
Water Science Taskforce

May 2016

Clean water for a healthy reef




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A NATURAL ICON IN TROUBLE

"The reef…on which we stood was one of nature's mysteries, its origins equally wonderful and obscure, its extent so vast, and its accomplishments so simple, so grand…"

- Joseph Beete Jules, geologist and coral scientist circa 1840's, From: The Reef: A Passionate History"

- **The Great Barrier Reef is precious.**
- The world's largest coral reef is a unique national icon with global significance.
- The Reef is comprised of approximately 3000 individual coral reefs along more than 2300 km of Queensland's spectacular coastline. It is home to more than 1600 species of fish and 130 varieties of sharks and rays.
- Covering an area of 344,000 square kilometres, the Reef is as large as Germany and larger than Great Britain, Malaysia or Italy.
- The Reef contributes an estimated $6 billion a year to the Australian and Queensland economy, supporting around 70,000 jobs.
- **But the Reef is in trouble—losing almost half its coral cover between 1985 and 2012.**
- Reef health (coral, seagrass and marine life) has been declining due to poor water quality and the cumulative impacts of climate change, including warmer weather leading to coral bleaching and increasing severity of extreme weather events such as cyclones.
- **Climate change is the most significant long-term threat to the Reef—improving water quality now will help build the Reef's resilience and its ability to bounce back from its impacts.**

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CLIMATE CHANGE— THE SINGLE BIGGEST THREAT TO THE REEF

- **The climate change risks of most concern are:**
  - ocean warming,
  - ocean acidification,
  - intensification of storm events, and
  - changes to the drought-flood cycle, impacting the neighbouring Reef catchments.
- While efforts to reduce global climate change are underway, the focus must also be on reducing the full range of pressures on the Reef in order to improve its long-term resilience.
- This will give the Reef a greater capacity to recover from climate change related disturbances and survive well into the future.
- The Taskforce recognises that the Queensland Government will need to consider how it can best meet international agreements around climate change.
- Queensland is well advanced in its work on developing mitigation and adaptation strategies. This will complement the work of the Taskforce.
- Failure to deliver meaningful action on climate change could impact the effectiveness of investments aimed at improving water quality. Dual action on climate change and water quality improvement will be critical for the future of the Reef.

The Taskforce recognises that to protect and maintain the health of the Great Barrier Reef in the long term, two things should be done:

1. **Reduce emissions** to keep average global surface temperature increases to below 2 degree Celsius*, and hopefully 1.5 degree Celsius over the long term. This means adopting a pathway to reduce greenhouse gas emissions over the next few decades consistent with international agreements to which Australia has committed to.
2. **Build resilience** by reducing all other stressors as much as possible, including poor water quality, crown-of-thorns starfish and other direct impacts like fishing.

**Above the Pre-industrial Period (i.e. from about 1750 as per IPCC 2014 and the Paris COP21 Agreement 2015).*

LAND USE IMPACTS TO THE REEF

- Coral, fish and other Reef species such as dugongs and turtles rely on healthy rivers and coastal catchments.
- Land use can reduce Reef water quality and ecosystem condition, through water running off land into rivers and eventually the Reef lagoon.
- **The greatest water quality risks to the Reef are:**
  - **excess nutrients** (especially nitrogen from fertiliser),
  - **fine sediments**, and
  - **pesticides.**
- Nitrogen runoff from fertiliser use is linked to outbreaks of coral eating crown-of-thorns starfish. Excess nutrients in the water also increases the susceptibility of coral to disease and promotes seaweed growth which competes with coral for space.
- Suspended sediment in water running off land reduces the light to seagrass ecosystems and inshore coral reefs, affecting coral settlement, growth and reproduction.
- Chemicals such as pesticides and herbicides also pose a risk to freshwater and some inshore and coastal habitats.

Crown-of-thorns starfish—outbreaks of which are linked to excess nutrients (Source: GBRMPA)

Gully erosion—runoff of sediment (Source: R Bartley)

Flood plume (Source: Dieter Tracey 2015)

ACHIEVABILITY OF OUR WATER QUALITY TARGETS

Sources of pollutants:

- **Ambitious water quality targets have been set for the Reef. These include, reducing nitrogen by up to 80 percent and sediment by up to 50 per cent by 2025 in key catchments such as the Wet Tropics and Burdekin.**
- **Agricultural land uses are the main source of nitrogen, sediment and pesticides into the Reef.**
  - **Cattle grazing is the dominant agricultural land use** (77%), particularly in the Burdekin and Fitzroy regions.
  - **Sugarcane** (1.4%) and **horticultural crops** (0.25%) **are more prevalent on the coastal floodplain with high rainfall and/or irrigation.**
- Other land and coastal uses, such as industry, ports and dredging, mining, sewage treatment plants and urban residential activity are relatively small overall sources of pollutants to the Reef; however they can be locally significant.

Progress to date

- The latest Great Barrier Reef Report Card 2014 shows modelled reductions in nitrogen (N) and sediment of only 17% and 12% respectively (averaged across all the Reef catchments) compared to a 2009 baseline.
- On average, fertiliser (N) application to cane fields across industry is 20-50% above that recommended in the Six Easy Steps Industry Best Management Practice (BMP) program, noting that this has been in place for over 10 years. As well as environmental consequences, this also implies reduced annual profitability of 10-15% for farmers.
- As of April 2016, 34% of farmers on around 50% of the cane land area—and 16% of graziers on 10% of the grazing land area—have participated in the industry BMP process. However, less than 5% of cane farmers and graziers have so far been formally BMP accredited.
- **While some progress is being made, it is not nearly rapid or widespread enough to achieve the water quality targets. Even full adoption of current best management practices for the sugarcane and cattle grazing industries will not be sufficient to meet our water quality targets.**

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ROLE OF THE TASKFORCE

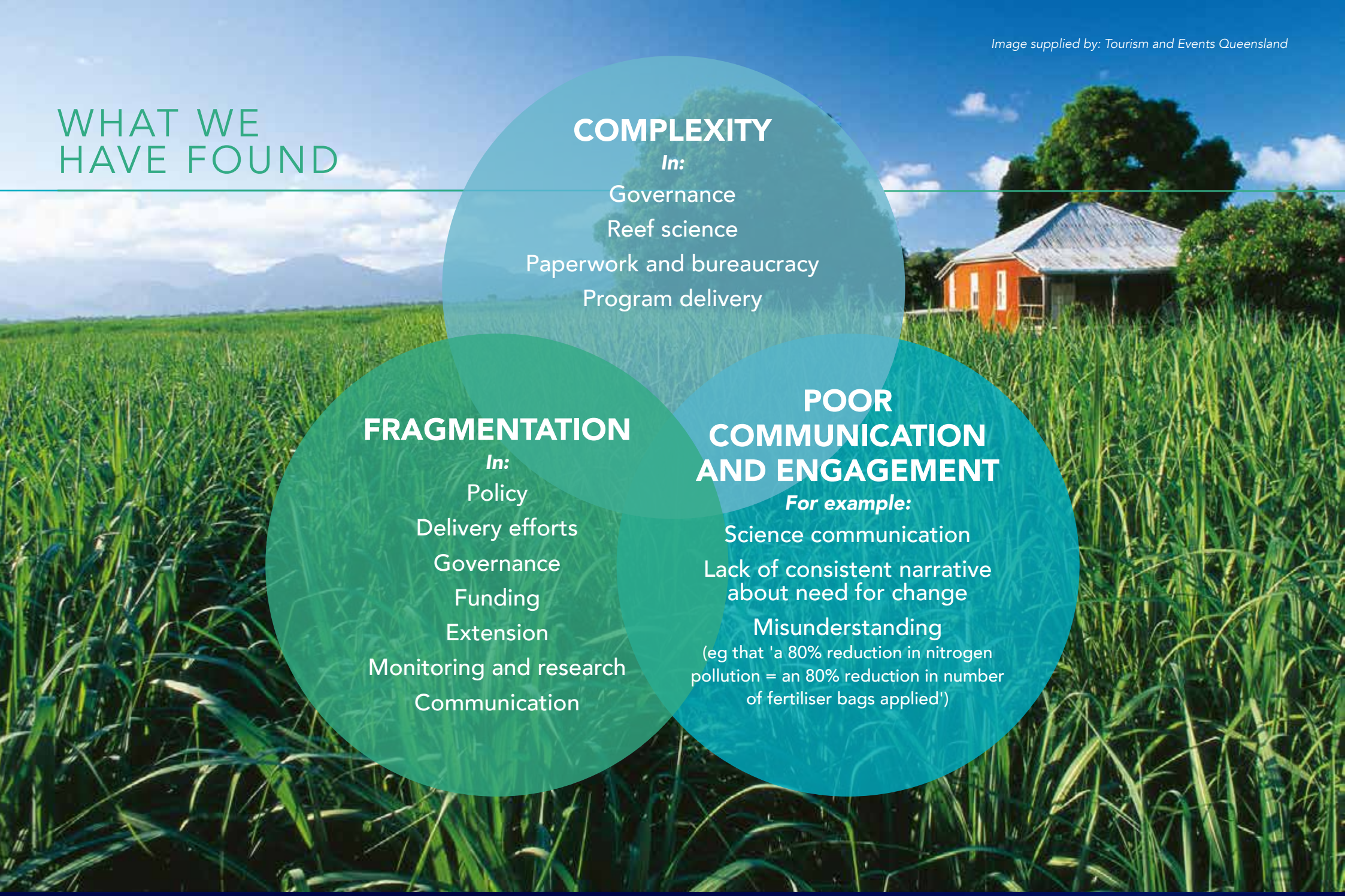
" This isn't rocket science…it's harder than that "

- quote from Taskforce member, on the challenge for the Taskforce

- The Great Barrier Reef Water Science Taskforce (the Taskforce) was formed in May 2015 to **provide advice on the best approach to meeting water quality targets and priorities for investing an additional $90 million over 5 years from the Queensland Government.**
- The Taskforce consists of experts in science, industry, government and the community and is chaired by the Queensland Chief Scientist Dr Geoff Garrett AO.

CONSULTATION

- **The Taskforce consulted widely with multiple stakeholders and key groups to gather their views on:**
  - how we can best meet the water quality targets,
  - what management approaches have worked well,
  - what haven't, and
  - what the investment priorities should be.
- The Taskforce released its interim report in December 2015 and undertook further consultation on its initial recommendations. These have been refined and further elaborated in developing the Final Report.
- The full Final Report is available at **www.gbr.qld.gov.au/taskforce**



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WHAT WE HAVE FOUND

COMPLEXITY

In:

Governance

Reef science

Paperwork and bureaucracy

Program delivery

FRAGMENTATION

In:

Policy

Delivery efforts

Governance

Funding

Extension

Monitoring and research

Communication

POOR COMMUNICATION AND ENGAGEMENT

For example:

Science communication

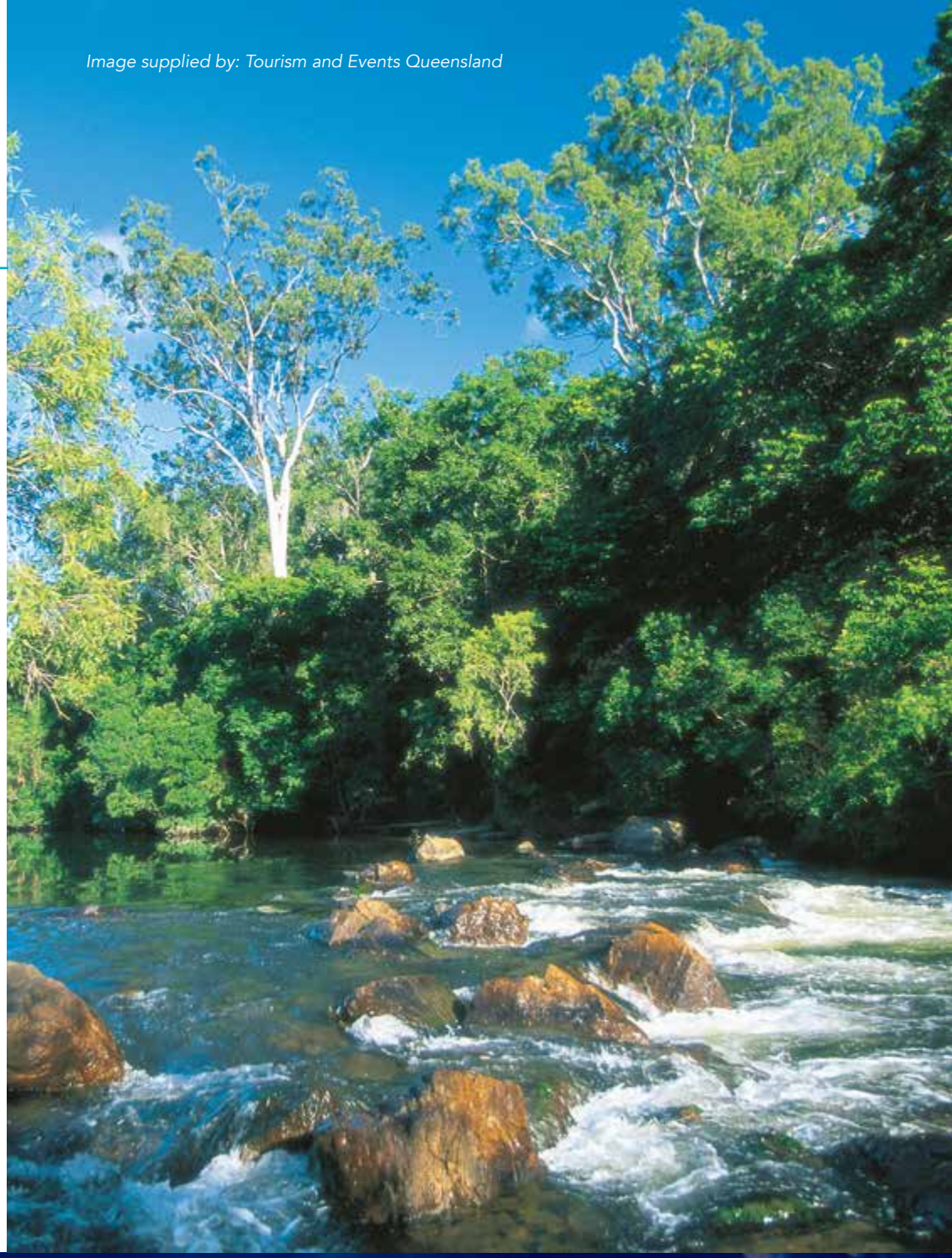
Lack of consistent narrative about need for change

Misunderstanding

(eg that 'a 80% reduction in nitrogen pollution = an 80% reduction in number of fertiliser bags applied')

A ROAD MAP TO A HEALTHY REEF

- We have a strategic framework for the future in the **Reef 2050 Long-Term Sustainability Plan (the Reef 2050 Plan)** that has strong political and public support. The Reef 2050 Plan covers the challenges and issues facing the Reef including ecosystem health, biodiversity, heritage, community and economic benefits and governance, with improving water quality a very high priority.
- **We are optimistic about building the resilience of the Reef.**
- We have a unique opportunity to work together to protect the Reef now and for future generations, recognising that it is a natural icon of global significance.
- **Success will require long-term commitment, leadership, adequate resources and financial and technical assistance to land managers.**
- The Taskforce Report provides a road map out to 2020, to rapidly accelerate from the progress to date. We set out the steps needed to deliver clean water for a healthy Reef. Regular reporting on progress will be critical.
- The $90 million investment will **provide a much needed boost to improving water quality** and Reef health and provide **a platform for change and a kick-start for further investment**.
- It is expected that the **funding required to meet the targets in the prescribed timescale will be well beyond what is currently allocated**.
- Noting that even full application of the best management practices across all farms in Reef catchments will not achieve the targets, a strong focus on innovation, new technologies and different ways of thinking will be needed.



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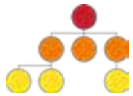
OUR RECOMMENDATIONS

- The Taskforce has made a range of conclusions and recommendations.
- These are presented in detail in the Full Final Report
- There is no **silver bullet** solution or intervention; rather, a mix of tools and approaches will be needed.

The following pages depict some of the Taskforce recommendations in the agricultural sector, with regard to nutrient and sediment reduction.

Image supplied by: Tourism and Events Queensland

Principles	Category	Recommendations
The Reef water quality targets are ambitious and important	**Targets** 	**1.** Review targets in 2016, feeding into the review of the Reef Water Quality Protection Plan.
A mix of tools is needed along the pathway to change	**Communication, collaboration and stakeholder engagement** 	**2.** Substantially improve communication and information to build an understanding of the pressures on the Reef and to support management practice and social change.
	Extension and education 	**3.** Invest in more effective, targeted and coordinated extension to support large scale land management practice change.
	Incentives 	**4.** Establish greater use of incentives and market approaches to support water quality improvement.
	Regulations 	**5.** Implement staged regulations to reduce water pollution throughout the Reef regions.
	Knowledge, science and innovation 	**6.** Better align science and fund development of new ideas and solutions.
	Monitoring, modelling, evaluation and reporting 	**7.** Fund additional long-term and finer scale catchment monitoring, modelling and reporting for improved decision-making and adaptive management.
Demonstration of all the recommendations in high risk areas through integrated projects	**Two major integrated projects** 	**8.** Implement two well facilitated major integrated projects (MIPS) in pollutant 'hot spot' areas to evaluate the most effective combination of tools to inform the design of future programs.
Smart delivery and sustained investment will be critical to success	**Investment planning** 	**9.** Develop a strategic investment plan and establish Reef-friendly public-private partnerships.
	Governance 	**10.** Simplify and strengthen governance and clarify roles and responsibilities within and between the Queensland and Australian Governments.

#More detailed recommendations supporting these are included in the Taskforce Final Report

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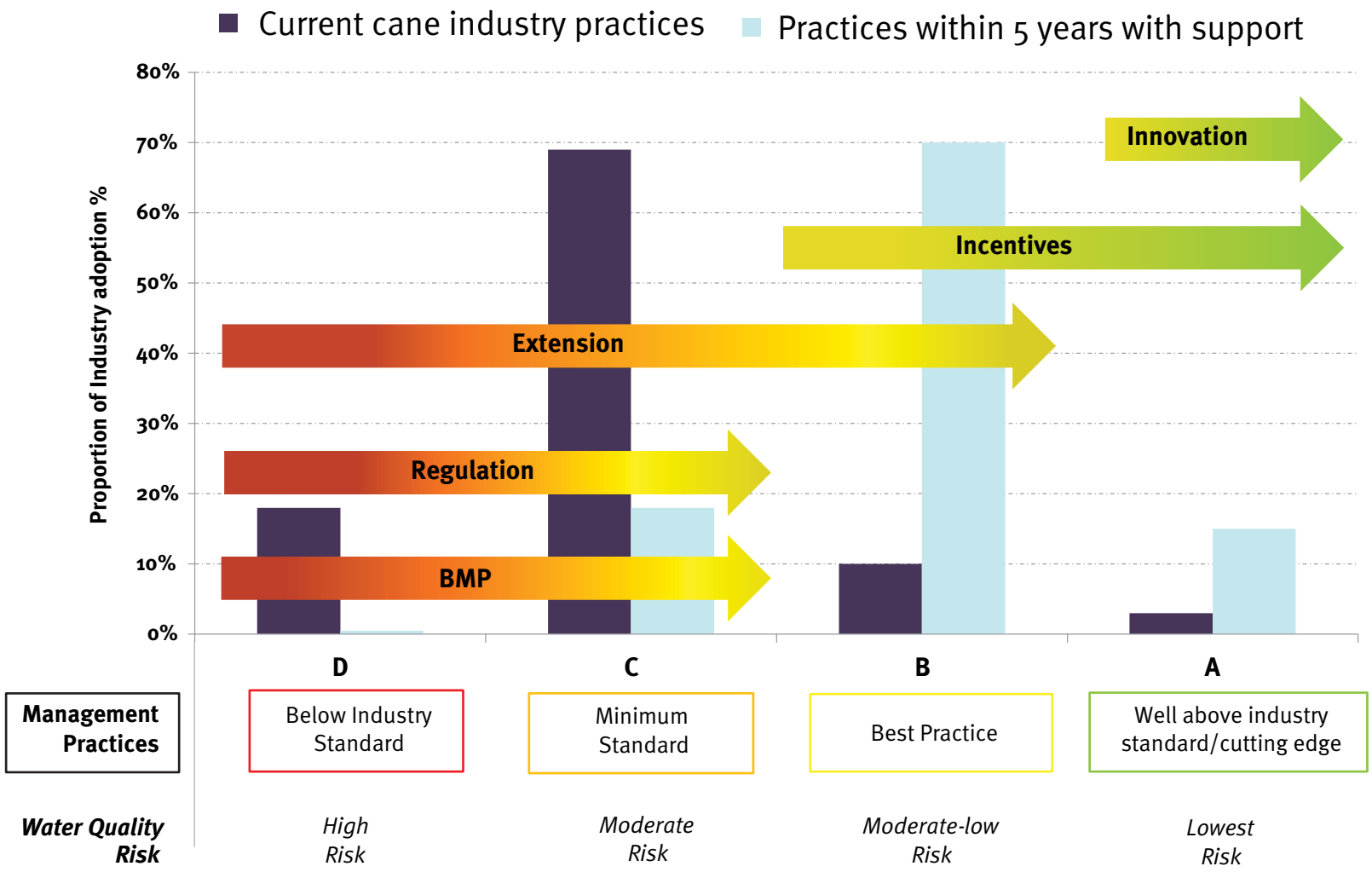
MIX OF TOOLS FOR FARMING PRACTICE CHANGE: CANE INDUSTRY EXAMPLE



Innovation: leading innovative farmers will be supported to develop and apply new approaches and role model these.

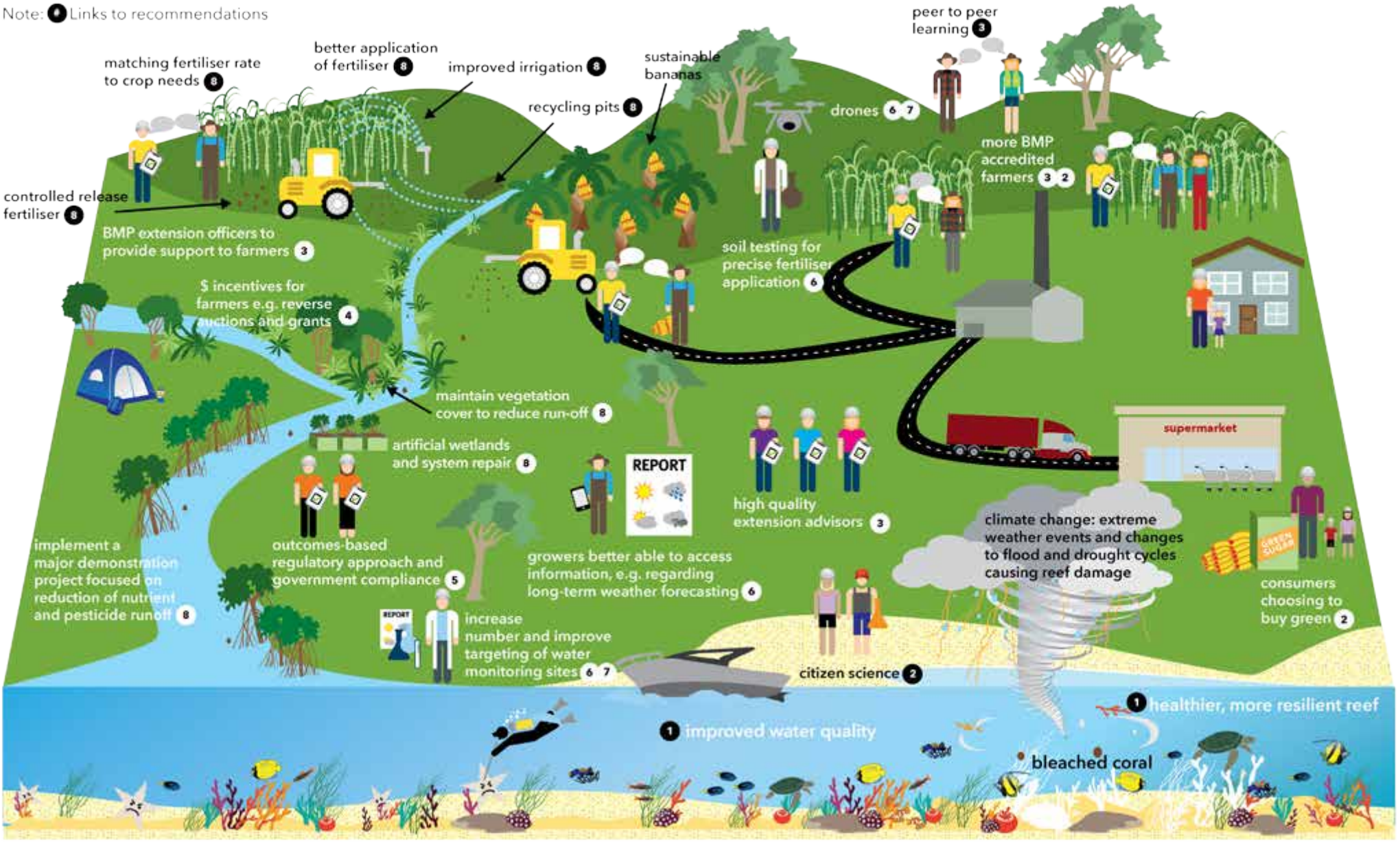
Incentives: will support best practice farmers and farmers working towards achieving best practice, to continuously improve.

Extension: will support farmers across the range of standards to improve their farming practices

Regulation: will be needed to achieve necessary compliance for farmers below or only just at minimum acceptable standards.

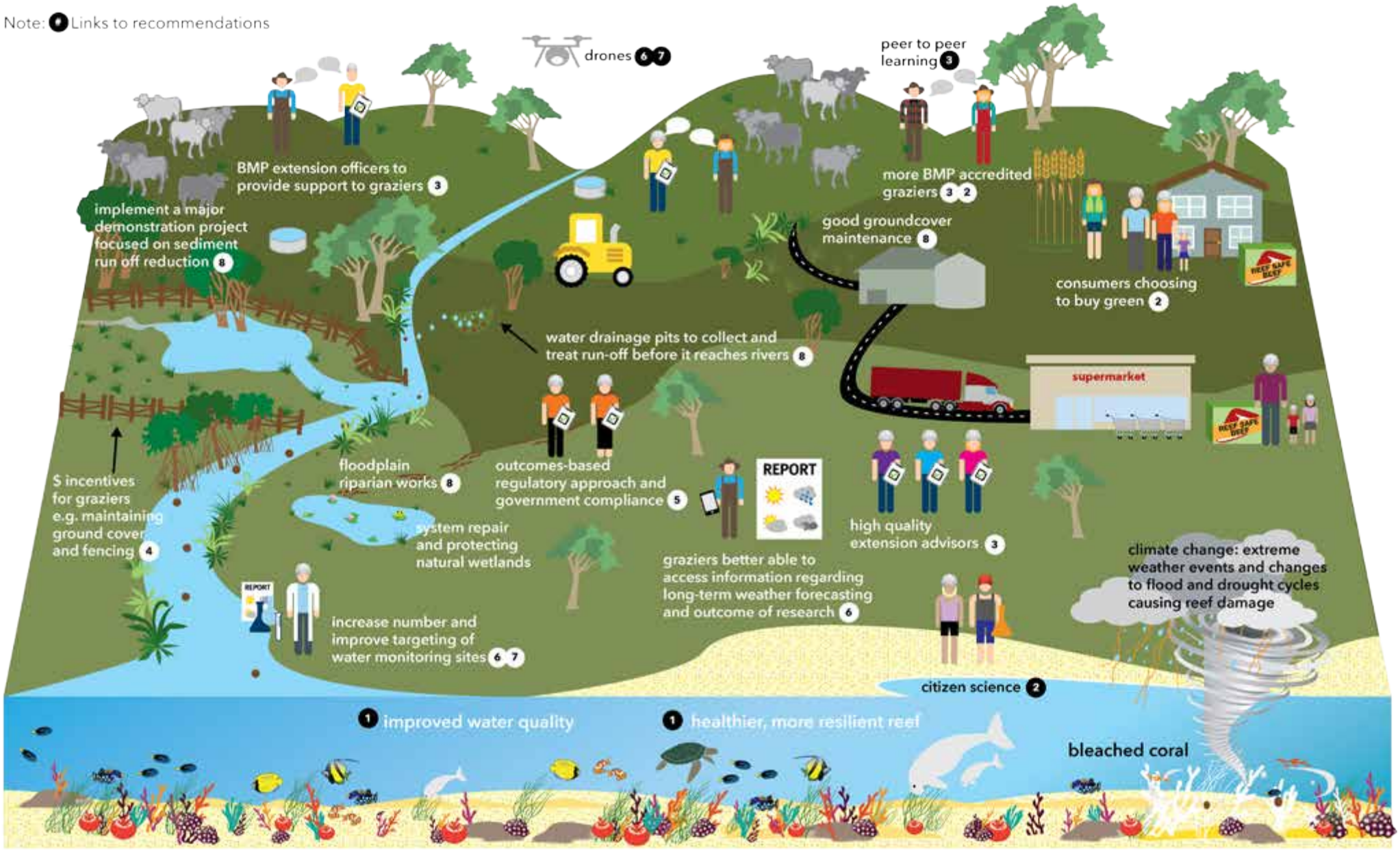
BMP: best management guidelines, and accreditation thereon, are crucial to bring the majority of industry to best practice standards.

Nutrient Pollutant Reduction: summary of on-ground agricultural management responses



Sediment Pollutant Reduction: summary of on-ground agricultural management responses

Note: ❶ Links to recommendations



EXISTING FUNDING

- **The Queensland and Australian Governments are providing significant funding for Reef water quality programs.**
- **Queensland has allocated an additional $90 million over the next four years, which the Taskforce is providing advice on**.
- In addition, **local councils in Reef catchments contribute significantly** through on-ground activities, urban water quality and point source management (for example, sewage treatment plants).
- Considerable cash and in-kind investment is also made by landholders, regional NRM groups, universities and private and philanthropic sources.

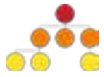
	2009-2013	2014-2018	Announcements post 2014
Queensland major funding commitments	**$175M**	**$175M**	**+$90M**
Australian Government major funding commitments	**$200M**	**$300M**	**+$171M (noting not all will be towards water quality)**
Total	**$375M**	**$475M**	

LIKELY FUNDING NEEDED TO ACHIEVE THE TARGETS

- A 'costings project' is currently being undertaken to support the work of the Taskforce in order to try to estimate the total costs of achieving the water quality targets by 2025.
- This work aims to be completed by July 2016 and will cost out a range of interventions to achieve the targets using water quality and economic modelling.

Image supplied by: Tourism and Events Queensland

SPENDING THE $90 MILLION

Recommendation	Category	Recommendation 8 Investment in Two Major Integrated Projects*	Reef wide funding	Total Investment
Recommendation 1	**Targets** 	**$0**	**$0**	**$0**
Recommendation 2	**Communication, collaboration and stakeholder engagement** 	**$1M**	**$5M**	**$6M**
Recommendation 3	**Extension and education** 	**$3.5M**	**$15M**	**$18.5M**
Recommendation 4	**Incentives** 	**$20M**	**$0**	**$20M**
Recommendation 5	**Regulations** 	**-**	**$15M**	**$15M**
Recommendation 6	**Knowledge, science and innovation#** 	**-**	**$9M**	**$9M**
Recommendation 7	**Monitoring, modelling, evaluation and reporting** 	**$9M**	**$11M**	**$20M**
Recommendation 8	***See Column**			
Recommendation 9	**Investment planning** 	**$0**	**$0.5M**	**$0.5M**
Recommendation 10	**Governance** 	**$0**	**$0.5M**	**$0.5M**
Already Committed	Taskforce Support (including supporting studies and economic work)			**$0.5M**
TOTAL		**$33.5M**	**$56M**	**$90M**

#The Two Major Integrated Projects may also access Reef-wide funding from Recommendation 6.

IMPLEMENTATION

An implementation pathway is included in the Taskforce's Full Final Report and outlines those actions that can be implemented immediately and in future years.

Immediate priorities include:

- Government sign-off of Taskforce recommendations
- Completing the costings project (by July 2016) to estimate the total costs of achieving the water quality targets
- Reviewing the targets in 2016
- Commencing communications campaign
- Boosting extension and knowledge sharing, including behaviour change initiatives in collaboration with the cane industry
- Commencing the two major integrated projects
- Filling monitoring gaps and setting up finer scale monitoring in the two major integrated project areas
- Establishing an Innovation Fund

It will be important that a level of flexibility is permitted in funding priorities and implementation to be able to respond to emerging issues and adapt accordingly.

Image supplied by: Tourism and Events Queensland

PLEASE GET INVOLVED!

You can be part of the solution.
Updates from www.gbr.qld.gov.au

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