THE IMPACT OF GOVERNANCE ON ENVIRONMENTAL OUTCOMES IN AUSTRALIAN NATURAL RESOURCE PLANNING AND MANAGEMENT

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ABSTRACT

This study addresses the general research question of how collaborative governance has impacted on environmental outcomes in Australian natural resource planning and management. The thesis argues that the discrepancy between theoretical expectations and practical results of collaboration lies in the implementation arrangements of collaborative governance. Within these arrangements, collaboration does not occur in a 'pure' form but rather, it is mixed with other governance approaches, such as hierarchy and markets. Collaborative governance not only is 'impure', but also inconsistent, as it occurs within a multi-level setting of governing centres. This mix of governance approaches and levels lead to a range of tensions within the overall collaborative framework. As a consequence, collaborative governance fails to coordinate the different actors and levels of governance involved in environmental policy and planning to achieve improved natural resource conditions. In practice, some actors are excluded, authority or power-sharing is limited, responsibility sharing is not properly defined, and mixed implementation instruments generate conflict.

This thesis focuses on the regional level of governance −represented by a set of Natural Resource Management (NRM) regions− in its interaction with federal and state levels of governance. The regional level is more directly involved with the implementation of natural resource planning and management. The study argues that there is an indirect relationship between governance and environmental outcomes. One in which governance represents an indirect driver or facilitator in the achievement of improved environmental conditions. The research adopts a mixed methods approach, based on qualitative and quantitative methods of analysis. Semi-structured interviews, water quality data and the application of the *process-outcomes* governance evaluation framework supported the analysis of the impact of collaborative governance on water quality outcomes achieved by a water quality plan in the Great Barrier Reef. The interpretation of the findings draws on concepts of metagovernance and governing approaches as well as on the conceptualization of the relationship between governance and outcomes.

The key findings are organised around three themes. The first theme relates to the limited, but mildly beneficial role played by collaboration in the achievement of water quality outcomes. Despite the marginal focus on the impacts of collaborative governance,

this governance approach has become the foundation of further water quality planning efforts in the GBR. The second theme focuses on the different impacts of regional collaborative governance approaches on environmental outcomes as a means explain the relationship between governance and environmental outcomes. It highlights potential positive associations between collaboration-environmental outcomes variables, based on a proxy variable of collaboration. This analysis is complemented by an explanation of the role of external factors to the indirect (but decisive) relationship between governance and environmental outcomes. The third theme relates to the tensions created by the intersection of different governance approaches within collaborative governance. This final theme focuses on the implications for collaborative governance approaches, based on the recognition of these tensions.

Declaration by author

This thesis is composed of my original work, and contains no material previously published or written by another person except where due reference has been made in the text. I have clearly stated the contribution by others to jointly-authored works that I have included in my thesis.

I have clearly stated the contribution of others to my thesis as a whole, including statistical assistance, survey design, data analysis, significant technical procedures, professional editorial advice, financial support and any other original research work used or reported in my thesis. The content of my thesis is the result of work I have carried out since the commencement of my higher degree by research candidature and does not include a substantial part of work that has been submitted to qualify for the award of any other degree or diploma in any university or other tertiary institution. I have clearly stated which parts of my thesis, if any, have been submitted to qualify for another award.

I acknowledge that an electronic copy of my thesis must be lodged with the University Library and, subject to the policy and procedures of The University of Queensland, the thesis be made available for research and study in accordance with the Copyright Act 1968 unless a period of embargo has been approved by the Dean of the Graduate School.

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Publications during candidature

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Statement of parts of the thesis submitted to qualify for the award of another degree

None.

Research Involving Human or Animal Subjects

This research involved the participation of human subjects. Appropriate ethics approval was obtained with the number 20161003. The ethics approval was granted on the 27th of October 2016 by the Ethics Officer of the former School of Geography, Planning and Environmental Management (which later became the School of Earth and Environmental Science): Iderlina Mateo-Babiano.

A copy of the ethics approval letter is included in the Appendix section of this thesis as Appendix F.

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who was born in 2017, the last year of this journey.

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LIST OF ABBREVIATIONS

ACF   Advocacy Coalition Framework

BMRG   Burnett-Mary Regional Group

BDG   Big/Dry/Graze

CfoC   Caring for our Country

CYNRM   Cape York Natural Resource Management

FBA   Fitzroy Basin Association

GAF   Governance Analytical Framework

GBR   Great Barrier Reef

GBRMPA   Great Barrier Reef Marine Authority

GSA   Governance and Systems Analysis

IAD   Institutional Analysis and Development Framework

MTM   Medium/Tropical/Mild

NAP   National Action Plan for Salinity and Water Quality

NHT   Natural Heritage Trust

NPM   New Public Management

NQDT   North Queensland Dry Tropics

NRM   Natural Resource Management

OECD   Organization for Cooperation and Economic Development

PIE   Plan Implementation Evaluation Framework

RDA   Regional Development Australia

RC   Reef Catchments

RGC   Regional Groups Collective

STS   Small/Tropical/Sugar

TRNM   Terrain Natural Resource Management

UN   United Nations

UNESCO   United Nations Education, Scientific and Cultural Organization

CHAPTER 1: INTRODUCTION

In 2008, the Australian government introduced an ambitious policy to improve the water quality of the Great Barrier Reef (GBR), one of its most important ecosystems. The policy was represented by the Reef Rescue program and it had a budget of A$200 million. Reef Rescue subsequently became the main implementation strategy of the Reef Plan, which was a water quality plan that relied on a collaborative governance approach to achieve a set of water quality targets. The targets had the goal of reducing the amount of pollutants generated by land-based runoff from agricultural activities. The collaborative delivery of the water quality plan was managed by natural resource management (NRM) organisations, responsible for the six NRM regions of the Reef catchment.

The budget of Reef Rescue was used to offer incentives to the landholders to voluntarily change their management practices. Landholders received money to improve the way they managed their land and this in turn, would reduce the run off that had become one of the major threats to the GBR catchment. The Reef Plan concluded after five years, in 2013, but the water quality condition of the Reef was considered poor by official evaluations (Australian Government, 2014a; Queensland Government, 2014). It seemed that — despite the collaboration and the money invested — the Reef Plan and Reef Rescue did not have a significant impact on water quality. Furthermore, water quality remains a major issue in the GBR even after other planning and management efforts have been put in place, such as the 2013 Reef Plan and the Reef 2050 Long-Term Sustainability Plan.

Regional NRM organisations were the main vehicle to implement the Reef Plan. Staff within these organisations had strong views on the Plan's possibilities as well as its pitfalls. One participant of this study was a regional NRM manager known here as George[1]. I asked him about the water quality issue, trying to find out what could have achieved better results for the GBR Catchment. Was it a problem of not having enough money to deliver the water quality plan? George said that it was "definitely not" due to not having enough money to deliver the water quality plan. In his view, the issue was

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[1] Following the ethical protocol that supports this research, I use a pseudonym to protect the identity of the research participant.

not insufficient funding to implement the plan. There was enough money. The problem was a lack of what he referred to as 'integration' and 'consistency' in delivering the plan. "The only thing we didn't do well was integrate". In particular he added, the issue was the poor collaboration between the federal and state governments. During the implementation of the Reef Plan, the state government decided to introduce regulations within the collaborative framework to complement changes in land management practices and that, George considered, was a major disruptor.

George believed that the challenge was establish effective collaboration between the stakeholders involved: the three tiers of governments as well as the other actors. For him, the primary route to improve water quality in the Reef is through voluntary change, which requires collaboration:

> "The only way we can achieve the water quality targets and the level of management practice change, and the high level of management practices is if landholders volunteer to do it, because no government is going to regulate everybody to achieve precision agriculture, high-level cutting-edge management practices. No government is gonna be able to do that."

Without being explicit, George was alluding to a problem of governance within the water quality planning and management efforts. Using words such as 'integration' and 'voluntary change', he was describing a problem with collaborative governance. Therefore, rather than being a financing problem, water quality issues were a governance problem.

Using George's observations as stepping off point, I investigate the impact of collaborative governance on the water quality outcomes achieved by the Reef Plan. Through this analysis, I explain how collaboration unfolded in the delivery of the plan. Then, I identify what worked and what failed in the collaborative approach, based on the water quality outcomes achieved. In the examination of the GBR case study, I offer a set of recommendations that could help address concerns such as those expressed by George. The findings of this evaluation of collaborative governance also have implications for other national or international cases.

1.1 Research problem

Environmental issues have become increasingly complex: their solution not only requires technical skills and scientific information, but also involves multiple state and non-state actors that interact at different levels of decision making and implementation. Coordinating these actors, and their actions, to address environmental issues, such as water supply, water quality or land degradation, is a matter of governance. During the decade of the 2000s, collaborative approaches to governance were widely adopted by governments to manage environmental problems. Collaboration was seen as an alternative to hierarchical or market forms of governance: this was due to the recognition by state and non-state actors that no individual actor had the capacity to solve these issues (Bell and Hindmoor, 2009; and Olvera-Garcia, 2012).[2]

Collaboration was considered more appropriate than hierarchical or market governance approaches to manage the complexity of environmental problems. In theory, it was expected that — by including the interests of all actors in the decisions and actions, and integrating their diverse knowledge — better solutions would be attained (Wondolleck and Yaffee, 2000; Taylor and de Loe, 2012). However, in practice there has been no strong evidence to support these expectations. Moreover, other studies argue that, given the multiplicity of interests involved, collaboration leads to an impasse or endless negotiations without clear actions (Lubell, 2004).

Overall, it is uncertain how the collaborative governance approach has contributed to the solution of environmental problems. One key issue is whether collaboration has led to improved environmental conditions. Recent research has focused on environmental outcomes achieved by collaborative approaches to provide more robust evidence about what can be expected from collaborating (Emerson and Nabatchi, 2015; Newig and Fritsch, 2009; Scott, 2015; Scott, 2016, Ulibarri, 2015). Through different methodologies and case studies, this small body of research have explained the complex proceedings of the collaborative approach. As a consequence, they are cautious in offering straight-forward conclusions, such as affirming that collaboration leads to better environmental outcomes than other governance approaches. This study follows up on their research focus in order to expand the body of evidence provided so far. Building on this existing

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[2] This agrees with George's remarks about the inability of the government to use a hierarchy approach, regulating everyone to improve water quality.

literature, my study has the research aim of finding the impacts of collaborative governance on environmental outcomes by focusing on the implementation phase of a collaborative policy. In this aim, I use the Australian context to analyse the impacts of collaborative governance on environmental outcomes. This research is significant as to date has been no clear attempt to examine the impacts of collaborative governance in the Australian context. Poor evidence about governance responses, such as collaboration, and their impact upon environmental issues is reinforced by the following statement from the United Nations report *Water in a Changing World*:

> "Most governance structures today are too weak to tackle current water problems, much less prepare for emerging problems, including climate change. And there is still very little evidence about which types of governance responses work in which contexts and what their impacts are on water equity, efficiency and sustainability" (UN, 2009, p. 73).

In Australia, as in many other developed countries, collaborative governance approaches were adopted in the 2000s in response to increasing land and water degradation issues. The collaborative approach was represented by the regional model of NRM established by the Australian government to improve the management of natural resources (Curtis et al., 2014). Among these NRM efforts, the GBR represents one of the most complex environmental problems. The GBR is one of the most important Australian ecosystems, and is recognised by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as a World Heritage Area. Different economic activities, such as mining, agriculture, coastal development and tourism impact on its natural resources, such as land, water and biodiversity.

Despite numerous efforts to improve the environmental condition of the GBR, concerns persist about the lack of progress — or worse — failure to achieve more enduring solutions. In 2014, the Great Barrier Reef Marine Park Authority (GBRMPA) concluded that, despite environmental planning initiatives to reduce threats and improve resilience, the GBR condition is poor and getting worse (GBRMPA, 2014). One of the most important issues relates to the impact of agriculture on the water quality of the GBR. Land-based run off caused by agricultural activities, such as grazing or sugarcane crops, represents the most important non-point source pollution of the Reef catchments, and is considered one of the major threats to the GBR (Hockings et al, 2014). Moreover, water quality from land based run off remained poor even after positive actions — such as *Reef Plan* — were undertaken in 2009, (GBRMPA, 2014). For this reason, in 2015,

the GBR risked being listed as a World Heritage in Danger area by the United Nations (UN) (Day et al., 2014). Diverse stakeholders from government, industry, community, and environmental sectors have interests in the resources of this ecosystem, which reflect the complexity involved in planning and management to achieve better natural resource conditions.

Since 2003, water quality planning and management efforts were established to improve the water quality condition of the GBR. The GBR catchment extends along six NRM regions that are managed by community-based NRM bodies through collaborative governance arrangements. The community representation within the NRM bodies is considered as 'shorthand for governance that starts from the ground up but deals with cross-scale interactions' (Berkes 2005 cited by Curtis et al. 2014., p. 176). It is basically about 'managing people-environment relationships' (Curtis et al 2014., p. 184).

Collaborative governance was adopted based on a regionalisation strategy devised by the Australian government, which intended to shift the responsibility of delivering water quality planning and management from the federal level to the NRM regions. The regionalisation strategy involved a decentralisation process in the implementation of environmental policy and planning. Nonetheless, the Australian government still retained control of the overall delivery of the *Reef Plan*. From the geographical point of view, 'the region' was considered to be the most appropriate scale for environmental governance, as the NRM regions were defined according to natural catchments or agro-ecological regions rather than political boundaries (Wallington, Lawrence and Loechel, 2007; Dale et al., 2013a).

In 2009, water quality planning adopted a collaborative governance approach that was expected to reduce significantly the impact of land runoff on the water quality of the GBR. The *2009 Reef Plan* was underpinned by *Reef Rescue*, an ambitious investment program from the federal government that represented the main implementation strategy of the *2009 Reef Plan* (Queensland Government, 2009). The main goal was to improve overall water quality in the five year period from 2008 to 2013. To understand the impact of collaborative governance on environmental outcomes, this study focuses on the *2009 Reef Plan* and the water quality outcomes it achieved. Environmental outcomes (e.g. the condition or health of natural resources) are used as an indicator for examining the type of contribution of collaboration in addressing environmental problems and, more specifically, how collaborative governance arrangements have

performed as responses to the issue of water quality.

Previous evaluations of the impact of governance in Australia focused more on the processes than the outcomes of environmental planning and policy efforts. For instance, Lockwood et al. (2009), undertook a study of the regional NRM model in three Australian states, which focused on the performance of protected areas based on a benchmark of 'good governance' criteria. Dale et al. (2008) reviewed governance arrangements in North Queensland regions, but without an explicit focus on the outcomes achieved. A similar study by Vogel (2013) evaluated governance within the Queensland regional model and focused on business excellence performance, rather than the achievement of natural resource outcomes.

This study assumes that governance is an important variable that underpins attempts to improve the health of natural resources, alongside technical and scientific approaches. This view is shared by the UN, which argued that water planning and management is a problem of governance: 'the water crisis is largely a crisis of governance' (UN 2006, p. 49). Evans (2012) supported this view by arguing that environmental issues are the consequence of a crisis of governance — a failure to organise societies and economies in a manner that does not harm the environment. Governance then becomes essential for re-organising society to achieve better environmental outcomes. In addition, Pahl-Wostl (2009) described the inability to achieve sustainable NRM as a failure of governance, reflected in over-regulation by rigid bureaucracies, sectoral fragmentation and prevailing dominance of economic over environmental considerations. Finally, Taylor (2010) stated that managing diffuse water quality pollution from agriculture is recognised as a critical governance challenge in the United States, Europe and Australia.

1.2 Research aim and questions

The main objective of this research is to explore the impact of collaborative governance on environmental outcomes obtained by natural resource planning and management. It seeks to determine how governance contributes to improving the condition or health of natural resources such as water, biodiversity and land. The examination of the impact of governance on natural resource conditions refers to the degree of effectiveness of certain governance arrangements. Hence, this research explores the effectiveness of

the collaborative governance arrangements in delivering NRM. Effectiveness is viewed as the degree of achievement of plan objectives. As highlighted above, there is little research that evaluates the impact of governance on environmental outcomes. This study aims to address that research gap. For this study, the planning and management of natural resources is embedded within environmental policy and planning. For example, NRM and planning constitute a type of planning and policymaking for the environment. Using Christensen's (2015) definition of outcomes — namely the results or consequences of completing and implementing the planning process — this research analyses the potential impact of collaborative governance on environmental conditions after the implementation of a plan. Examining the outcomes (compared to the objectives of a policy or plan) is a way to assess the effectiveness of governance arrangements at delivering improved environmental conditions. Appendix A offers more detail about the objectives of the research aim.

By the 'impact upon the achievement of environmental outcomes', I mean investigating if collaborative governance has facilitated the achievement of these outcomes, or has been neutral, or has become a barrier in their procurement. There is a relationship between governance (e.g. human institutions) and environmental outcomes, in which the latter are indirectly driven and shaped by governance institutions. Moreover, previous research states that, without effective governance arrangements, natural resources and the environment are subject to increased human consumption and depletion over time (Dietz, Ostrom and Stern, 2003).

Another view of the relationship between governance and outcomes focuses on the values that are privileged by governance arrangements, such as development-driven values that give preference to industry concerns. These values are reflected on the environmental outcomes: "a change in environmental outcomes, in terms of revising whose values are privileged by environmental decisions, often requires institutional changes at different levels" (Adger et al., 2003, p. 1100). Introducing and managing institutional changes is, in the view of this study, a matter of governance. To explore the relationship between governance and environmental outcomes, this thesis takes a multidisciplinary approach and draws on theories from planning, political science, public policy and environmental management. Governance and the implementation of natural resource planning and management are the main research subjects.

"While implementation research consumes the activities of a good number of scholars from

the fields of political science, public administration, and management science, there has been a curious lack of parallel inquiry into the implementation process involved in the planning field." (Talen, 1996, p. 248).

It is important to note that this research is not an evaluation *per se* of plan implementation. Instead, it is an examination of the impact of governance on natural resource conditions by focusing on actions and outcomes at the implementation phase.

For this purpose, I focus on the implementation process within natural resource planning to find out how outcomes, such as changes to the condition of natural resources, are produced. For practical purposes, I focus on water resources and their outcomes, such as improvements in water quality. In this sense, I seek to assess the impact of collaborative implementation upon water quality outcomes to identify how it operates as well as its challenges. It is important to note that the collaborative governance arrangements are considered to have an indirect impact, one that contributes to facilitate or obstruct implementation, which leads to the achievement of outcomes. However, to fully address environmental issues, other variables need to be taken into account, such as the socio-economic context, the political situation or the ecological and geographical conditions.

1.2.1 Research questions

This thesis poses the following research question**:**

How has collaborative governance impacted on environmental outcomes in Australian natural resource planning and management?

Addressing this question sheds light on the results achieved by collaborative forms of governance in the Australian context, and the complex relationship that exists between collaborative governance and environmental outcomes. To answer this main research question, I address four research sub-questions based on the case study analysis of the GBR:

1. What was the role of collaboration in implementing the *2009 Reef Plan*? — Chapter 6

2. How did regional collaborative governance approaches impact on environmental outcomes achieved by the NRM regions of the GBR? — Chapter 6

3. What were the strengths and weaknesses of the collaborative governance approach? — Chapter 7

4. What are the implications of collaborative governance in Queensland's natural resource planning and management? — Chapter 8

In the first research sub-question, I identify and explain the role of collaborative governance in a water policy: the 2009 Reef Plan devised to improve the condition of water quality in the GBR, and *Reef Rescue*, the main implementation strategy of the plan. In this research, the analysis of collaborative governance is framed by the definition of the concept established by Ansell and Gash (2008). Briefly, collaborative governance refers to the formal, deliberative and consensus-oriented engagement between state and non-state actors to make and implement public policy or manage public programs. In this respect, the role of collaborative governance explained in the first research sub-question focuses on the formal collaborative ties supporting the implementation of the water quality plan. As a consequence, it also focuses on the *Reef Rescue* program. The findings on the examination of collaborative governance is based on official reports and evaluations as well as the perceptions of key stakeholders that participated in this research.

The second research sub-question examines the impact of regional collaborative governance on the environmental outcomes achieved by the NRM regional bodies, the main actors implementing the *2009 Reef Plan*. The analysis focuses on the regional scale of governance, which is the main focus of implementation for the water quality plan. Focusing on the scale at which the policy or plan was implemented also helps to improve understanding of the impact of governance on environmental outcomes (Newig and Fritsch, 2009). The regional governance scale of this case study relates to the operational or action level of collaborative efforts, where on-ground activities are located (Margerum, 2008). To examine this research question, I develop a proxy variable for collaboration with the purpose of differentiating between the collaborative approaches adopted by the GBR's NRM regions. The variable is represented by the existence of coordinators in each NRM body (the organisations responsible of managing the NRM regions and delivering the *Reef Plan)*. Coordinators of each NRM body had the role of engaging with the local agricultural producers to promote changes in land management practices.

This question then explores the impact of regional collaborative governance on water quality outcomes. As each NRM region achieved different water quality outcomes, the analysis of the second sub-question explains the potential impact of the collaborative approach of each NRM body in achieving those outcomes. The main purpose is to clarify the indirect relationship between collaborative governance and environmental outcomes. This relationship is characterised by uncertainty regarding the likely impact of collaboration (as if the collaborative process is a 'black box' process). In addition, it explains the impact of context and external factors to the regional collaborative process, by examining why NRM regions with less funding for on-ground delivery achieved better water quality outcomes. The analysis is based on official data on water quality outcomes and document analysis, and is complemented by the perceptions of key stakeholders.

The third research sub-question returns the focus to the multiple scales of governance involved in the *Reef Plan's* collaborative governance arrangements (national, state, regional and local) to undertake the evaluation of collaborative governance based on the *Process-Outcomes* governance evaluation framework developed by Rauschmayer et al. (2009). This evaluation focuses on the collaborative processes and their impact on the water quality outcomes achieved. The collaborative processes and the governance evaluation framework are based on a review of previous research, presented in Chapter 4.

The answer to this question explains how collaborative processes had a mixed impact, which contributed to facilitate or block the achievement of water quality outcomes. The elements that facilitated the achievement represent the strengths of the collaborative approach, while the elements perceived as blocking the achievement of outcomes represent the weaknesses. The explanation also highlights the tensions found in the collaborative approach, such as the use of contrasting implementation instruments (e.g. regulations and incentives), and the promotion of competition while relying on collaborative arrangements. In other words, the impact of collaborative governance on environmental outcomes cannot be viewed as a cause-effect relationship, but rather as a relationship where governance contributes to achieving the outcomes. Governance, on the other hand, represents only one variable among the multiple variables involved in environmental issues. In this regard, the analysis argues that governance impacts only partially explain the achievement of environmental outcomes.

The fourth research sub-question presents the inferences from the analysis and offers

a set of recommendations for policy-makers and planners. This addresses the 'so what' question of this research. It also highlights the importance of collaborative governance based on its impact on the environmental outcomes examined in the case study, and the necessity to use metagovernance to improve the collaborative approach and contribute potentially to improved environmental outcomes.

The answers to the four research sub-questions help to construct the answer to the main research question, in which I argue that collaborative governance, in general, has had a positive but limited impact on environmental outcomes. To have a positive contribution on achieving environmental outcomes, collaborative governance requires modifications.

1.3 Research significance

This evaluation of governance contributes to a better understanding of the impact of collaborative governance on the environmental outcome of a plan or policy by clarifying the relationship between governance arrangements and environmental outcomes. Moreover, this helps to identify the significance of the role of collaborative governance (in terms of what and cannot be expected from this approach) within environmental policy and planning. It does this by explaining the extent to which collaboration has led to improved environmental outcomes.

Earlier, I argued that funding alone would not achieve the expected results of a policy or plan; proper governance arrangements are needed. By examining the impact of the collaborative approach on environmental outcomes, this research provides information to improve governance arrangements and achieve better environmental outcomes.

Furthermore, the thesis contributes to the research on planning and policy implementation by providing a better understanding of implementation within a collaborative setting.

Finally, the thesis provides clarity to the uncertainty regarding the contribution of governance to the environmental outcomes achieved through environmental policy and planning. These research findings contribute to promote learning between NRM practitioners (policymakers, planners and managers, among others) by disseminating information about strengths and weaknesses of the collaborative approach.

1.4 Thesis structure

The thesis is organised into eight chapters. Following the introduction, Chapter 2 presents a literature review to theoretically ground the research problem and the conceptual framework of the thesis. This literature review revisits governance concepts and frameworks. In this review, I define collaborative governance to frame the analysis and present a conceptual framework that explains the connection between the key concepts involved in this study: governance; policy and planning; implementation; and outcomes. In this chapter, I also review governance frameworks involved in governance evaluations, and select the most appropriate one for this study following the outcomes-focus of the research. Additionally, I present the concept of metagovernance and the meaning of effective governance and, finally, I provide a general account of the Australian approach to environmental governance.

Chapter 3 presents the methodology used in the research, which consists of a case study analysis that combines quantitative and qualitative methods of data analysis. I explain the pragmatic and post-positivist views adopted in this research (Creswell, 2014). I also explain case study analysis — the research strategy adopted in the study — and the relevance of this method for the examination of the collaborative governance approach. Finally, this chapter justifies the selection of the chosen case study and the governance evaluation framework. It offers details on the research methods employed for data collection and analysis, how the research participants were chosen and contacted, as well as the software that supported the analysis.

The critical review of research on the impact of collaborative governance on environmental outcomes is presented in Chapter 4. This chapter shows the results obtained by previous analyses regarding the impact of collaboration on different environmental outcomes, such as land, water and biodiversity. The review addresses the research sub-question on the contribution of collaborative governance in improving the condition of natural resources. Apart from the results (classified as positive, neutral and negative impact of collaboration), I develop collaborative governance criteria based on a set of common elements examined by the reviewed studies. The criteria are incorporated into the governance evaluation framework explained in Chapter 3 and the results of the review serve to offer a research background to this study, highlighting the lack of similar research in Australia.

In Chapter 5, I present the background to the case study, describing the conditions and characteristics of the six NRM regions in the GBR, which were the main vehicle to implement the Reef Plan. Additional to this context, I provide a historical background of water quality planning in the GBR, from 2003, when the first Reef Plan was implemented, until the current plan in 2015. The purpose here is to present an overall view of the water quality planning efforts and their achievements. Within this historical depiction, I describe the Reef Plan and Reef Rescue policies, outlining its goals and strategies as well as its official governance arrangements. I conclude this chapter with a brief account of previous official evaluations of the Reef Plans.

The answers to the first and second research sub-questions are presented in Chapter 6. In this chapter, I offer the findings of this first part of the case study analysis. First, I explain the role of collaborative governance in the implementation of the Reef Plan. This role differs from the one presented by the official documents. I describe how the governance arrangements worked in practice, based on the stakeholders' account of them. Then, I present the analysis of the impact that regional collaboration had in achieving water quality outcomes. I focus on the regional governance scale to analyse the different water quality outcomes achieved by the NRM regions within the GBR. In this analysis, I use a proxy variable for collaboration to distinguish about each region's collaborative approach.

The objective of using this proxy variable is to attribute a tangible element to regional collaborative governance (in this case, the role of coordinators of each NRM body) and examine its impact on water quality outcomes. The use of this proxy variable also provides a potential explanation to why some regions with less funding achieved better water quality outcomes. The analysis of regional collaboration, and its impact on water quality outcomes, is complemented by an analysis of the NRM region's context as well as the identification of external factors to the collaborative governance approach. Context and external factors complement the explanation about the impact of regional collaboration on water quality outcomes.

Chapter 7 answers the third research sub-question, and represents the second and final part of the case study analysis. In this chapter, I evaluate collaborative governance using the governance evaluation framework along with the collaborative governance criteria. In this evaluation, I include other levels of governance (not only the regional level) involved in the implementation of the *Reef Plan*, to present the findings on the

overall impact of collaborative governance on water quality outcomes. The evaluation is based on stakeholder perceptions as well as data on water quality outcomes. I complement it with other evaluations of the Reef Plan as well as related literature. Within this evaluation, I identify the strengths and weaknesses of the collaborative approach, classifying them as positive, neutral and negative impacts on water quality outcomes. The classification of the impacts of collaboration uses a similar approach to the results presented in Chapter 4.

The discussion of the findings and implications of this study is presented in Chapter 8. The discussion is led by the argument that, ultimately, a better understanding of governance contributes to improved quality of the environment and, in consequence, quality of life. This final chapter of the thesis also includes the conclusion as well as identifies limitations and further research areas. In this part, I answer the fourth and final research sub-question, discussing the key findings and contrasting them with the literature (national and international studies). This chapter concludes with a brief summary of how collaborative governance impacts environmental outcomes, highlighting the importance of this research in providing governance information to future environmental policy and planning efforts.

CHAPTER 2: COLLABORATIVE GOVERNANCE, GOVERNANCE FRAMEWORKS AND THE AUSTRALIAN GOVERNANCE MODEL

2.1 Introduction

This literature review is organised around three elements — governance, policy and planning and implementation — and the interaction between them and how they contribute to achieving environmental outcomes. To conceptualise the interaction between planning-governance-implementation, I review governance frameworks. These three elements comprise the theoretical framework used to analyse governance impacts on environmental outcomes. Finally, an overview of Australian environmental governance is presented.

2.2 Governance

To analyse the impact of collaborative governance on environmental outcomes, it is necessary to define governance. However, this concept is an elusive term with varied definitions and different foci: hence, there is no agreed definition amongst scholars. Overall, governance is about governing, and governing means shaping, regulating or attempting to control human behaviour to achieve collective ends (Bell and Hindmoor, 2009). The concept of governance has extended to economic, political, corporate, environmental or information technology areas. One advantage of the vague meaning of governance is the flexibility of the term, which allows its adoption by different fields and in different contexts. However, the negative aspect of this flexibility is the risk of it becoming an overused term that embodies generalities resumed in the goal of aspiring to a better world (Bevir, 2009). Given the range of definitions, I developed a classification system of four categories that capture the main conceptualisations of governance: such a classification system will help to better understand and operationalise the concept (see Table 2.1 below for more detail). Each category is complemented by a set of underlying theories provided by Bevir (2009):

1. Network-based: this emphasises interactions between different actors (not only from the state) in a context of interdependence with self-governance as the main outcome (Rhodes, 1997; Stoker, 1998; Kooiman, 2003; Hufty, 2011).

2. Performance-oriented: this focuses on the ability to deliver public goods, either by the government itself or in conjunction with other actors, e.g. private or community sectors (Peters et al., 1995; Rhodes, 1996; Parker and Braithwaite, 2003; Fukuyama, 2013; Rotberg, 2014).

3. Institution-based: this defines a system or a process of organisation based mainly on institutions that shape the decision-making process and the management of public affairs. Institutions and rules are the main outcome (UNDP, 2000; Healey, 2003; Bevir, 2009; IOG, 2015).

4. Coordination-oriented: this highlights the coordination of different interests and objectives from the actors involved in a given public issue. This coordinating role is undertaken by the government through the use of its power or authority (Pierre, 2000; Bell, 2002; Hooghe and Marks, 2003; Bell and Hindmoor, 2009; World Bank, 2014).

As it can be seen by the multiple definitions presented, the concept of governance lacks an agreed definition and, as a consequence, multiple perspectives and conceptualisations have been provided by scholars. As this research focuses on the impact of a given form of governance (i.e. collaboration) on environmental outcomes, it adopts a performance-oriented perspective. In this perspective, as shown by the definitions in Table 2.1, governance is oriented at the delivery of public services and, ultimately, at the well-being and quality of life of citizens. Using this lens of performance orientation, governance is aimed at problem-solving, rather than at how institutions operate and interact (i.e. institution-based lens) or how networks between actors foster self-governing processes (i.e. network-based lens). This performance-oriented perspective frames the definition of collaborative governance presented in the next section. In this respect, the view of governance refers to the governing performance in delivering plans and policies and the results they achieve after implementation (e.g. environmental outcomes). In this sense, governance in this study does not focus on corporate governance aspects, such as financial accountability, or normative aspects, such as 'good governance' principles or guidelines. However, it is important to clarify that this research does not examine the processes of governance *per se* but rather, their impact upon environmental outcomes.

Table 2.1 Governance definitions.

Type	Definition
Network-based	1. Governance is about autonomous self-governing networks of actors (Stoker, 1998). 2. Inter-organisational and self-organised networks that are characterised by interdependence, resource exchange, rules of the game, and significant autonomy from the state (Rhodes, 1997). 3. A coordination process that occurs within networks (Kooiman, 2003). 4. The interactions among structures, processes and traditions that determine how power and responsibilities are exercised, how decisions are taken, and how citizens or other stakeholders participate (Graham et al, 2003). 5. The pattern or structure that emerges in a socio-political system as a result of the interacting intervention efforts of all involved actors. This pattern cannot be reduced to one actor or group of actors in particular (Kooiman, 1993). 6. "The processes of interaction and decision-making among the actors involved in a collective problem that lead to the creation, reinforcement, or reproduction of social norms and institutions" (Hufty, 2011, p. 405).
Performance-oriented	1. Performance of governments in the delivery of political goods, following the sum of needs, desires and expectations of citizens (Rotberg, 2014). 2. "Government's ability to make and enforce rules, and to deliver services, regardless of whether that government is democratic or not" (Fukuyama, 2013, p. 350). 3. Intentional shaping of the flow of events in order to deliver desired public goods (Parker and Braitwaite, 2003). 4. The joint role of government, semi-government, nongovernment, and private institutions in providing for citizens' well-being. (Peters and Savoie, 1995) 5. New method by which society is governed, synonym with steering (more governance) and less rowing (less government) of service delivery, which is devolved or contracted-out to private actors (Rhodes, 1996) 6. "Totality of interactions, in which government, other public bodies, private sector and civil society participate, aiming at solving societal problems" (Meuleman, 2008, p. 11)
Institution-based	1. A system of values, policies, and institutions by which society manages its economic and social affairs (UNDP, 2000). 2. Arrangements and qualities of a set of institutions and rules by which decisions are made and authority exercised (Bevir, 2009). 3. Determines who has power, who makes decisions, how other players make their voice heard and how account is rendered. Exists anytime a group of people come together to accomplish an end (IOG, 2015). 4. The processes by which societies, and social groups, manage their collective affairs (Healey, 2003). 5. "A system of rules that shapes the actions of social actors" (Treib et al., 2007, p. 3).
Coordination-oriented	1. "Exercise of authority by governments on behalf of citizens" (Rotberg, 2014, p. 4). 2. A style of governing that refers to sustaining co-ordination and coherence among a wide variety of actors with different purposes and objectives (Pierre, 2000). 3. The use of institutions, structures of authority and even collaboration to allocate resources and coordinate or control activity in society or the economy (Bell, 2002). 4. Traditions and institutions by which authority in a country is exercised (World Bank, 2014). 5. A binding decision making in the public sphere (Hooghe and Marks, 2003). 6. The tools, strategies and relationships that governments use to assist governing (Bell and Hindmoor, 2009). 7. "The structures and practices involved in coordinating social relations that are marked by complex, reciprocal interdependence" (Jessop, 2011, p. 4).

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Ontologically, the study of governance is approached through a realist philosophy which assumes that conflicts and struggles are inherent in the interactions between actors framed by institutional structures (Biesbroek et al., 2014). This philosophy differs from the optimist perspective, which views governance as essentially an effort to solve societal problems where an adequate design of the implementation process would guarantee the achievement of the expected outcomes (Biesbroek et al., 2014). This research fits more with the optimistic philosophy, as it focuses on the strengths and weaknesses of a governance approach (e.g. what worked and what failed) in the solution of an environmental problem. The result of this analysis involves suggesting improvements to governance that would contribute to achieving the expected outcomes. This research, however, acknowledges the realist philosophy in the sense that conflict is unavoidable in human interactions. However, the impact of conflicts and struggles in the interactions between actors, such as politics, is beyond the scope of this study.

2.2.1 Collaborative governance

Collaborative governance is a mode of governance or governance style. Modes of governance represent the outcome of social processes but, more importantly, they also provide "the medium through which actors interpret and act to shape their reality" (Lowndes and Skelcher, 1998, p. 318). Meuleman (2008) refers to modes of governance as governance styles, which he defines as "the processes of decision-making and implementation, including the manner in which the organisations involved relate to each other" (Meuleman, 2008, p. 12). Broadly, three governance styles have been used by Western democracies in attempts to deal with policy and planning issues throughout the 20th and 21st centuries: hierarchical (top-down), market and network governance (bottom-up) (Meuleman, 2008). These three governance styles represent forms of social coordination in the attempt to manage social affairs. In this respect, it is important to differentiate between governance and coordination. Here, 'governance' refers to the regulation of elements in a system, while 'coordination' refers to the alignment of elements in a system (Thompson, 2003). Hence, governance regulates and guides coordination through three main approaches: hierarchy, markets and networks. Combining the definitions of governance styles and modes, this study uses the term governance approaches, which I re-define by combining the styles and modes definitions as:

> Processes of decision-making and implementation in which actors shape their reality through their relationships, reflecting also their interpretations of reality.

In other words, the governance approach indicates the manner in which decisions are made and implemented to deal with certain policy and planning issues, while showing the view of reality (based on values, norms and ideologies) of the actors involved in that governance approach.

This study adopts the definition provided by Ansell and Gash (2008) to frame the analysis:

> "A governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programs or assets" (p. 544).

The authors highlight the formal, consensus-based and deliberative nature of collaborative governance in making or implementing public policies (in which natural resource planning fits). The definition leaves aside informal forms of collaboration and emphasises shared understanding between the actors, particularly in agreeing to problem definition. Ansell and Gash (2008) warn that collaborating might not be the best alternative if there is a history of antagonism amongst the stakeholders. In this situation, they argue that collaboration will only succeed if two conditions are met: 1) there is a high level of interdependence between the stakeholders; and 2) there are strategies in place to increase trust and social capital among the participants in the collaboration. Ansell (2012) explains that collaboration is not a consultation process. Collaboration implies that participants have a well-defined decision-making role, and are not merely being consulted about their views in a tokenistic way.

Following this definition of collaborative governance, this approach fits within the third type governance approach, network governance. Collaborative governance is then a type of network governance. Ansell (2012) explains that collaboration occurs in specific forums, while network governance is a structured relationship of coordination. However, he adds that both concepts tend to overlap in practice. Hence, for practical matters, I view collaboration as a governance approach within the main network approach.

Another established and highly cited definition of collaborative governance was

developed by Emerson et al. (2012):

> "The processes and structures of public policy decision making and management that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private and civic spheres in order to carry out a public purpose that could not otherwise be accomplished" (p. 2).

This definition is broader than that provided by Ansell and Gash (2008) as it includes more actors, partnerships and a broader scope (i.e. it considers informal collaborative arrangements). Nonetheless, both definitions adopt a performance-based perspective, which outlines that the purpose of collaborating is to carry out or implement public policies. As this research focuses on formal collaborative arrangements between state and non-state actors in the public sector, Ansell and Gash's (2008) definition fits better with the governance analysis undertaken. The definition of Emerson et al. (2012) is more appropriate for analysis of collaboration that focus on informal processes as well as for private and civic domains.

According to Bingham (2011), collaborative governance is differentiated from governance by its focus on the partnership processes between public and private stakeholders to achieve policy goals. Collaborative governance is distinguished by four aspects:

1. Collaboration with partners within and outside the government, such as the general public, national, state, regional and local government agencies; tribes, NGOs, civil society, business and other non-governmental stakeholders.

2. Collaboration may occur at any stage of the policy process, from defining and setting an issue to developing and implementing a policy, and evaluating its impacts. Collaboration also expands to the enforcement of rules and regulations through agency adjudication or litigation.

3. Collaboration occurs within any method, model or process that is deliberative and consensual, including dialogue, public deliberation, public consultation, multi-stakeholder collaboration, consensus-building, negotiation and dispute resolution.

4. Collaboration includes both in person and online methods for collaborating.

2.2.2 Research gap and contribution to Literature

The contribution of this study is through advancing the understanding of collaborative governance by examining its impact in the implementation phase of the policy process, where the environmental outcomes are produced. Bingham (2011) observes that there is a lack of research on the institutional design (e.g. governance arrangements) of collaboration as well as their impacts. Moreover, she argues that there is no common frame of analysis to examine the varied collaborative processes and structures. The Institutional Analysis and Development framework (IAD) would be the closest one to do this, but it still lacks general validity. In other words, there is no frame of analysis with general validity. Finally, Bingham (2011) argues that understanding collaborative governance is advanced by examining its relationships with different phases of the policy process. She explains the link between governance and the policy process through the metaphor of a "flowing stream": In this metaphor:

- 'Upstream' describes policymaking through legislative or quasi-legislative activity, usually with limited public participation. Inclusiveness, deliberativeness, and influence are offered as the three criteria to evaluate the quality of the upstream process.

- 'Midstream' (which is where this study fits) describes as implementing, managing, and evaluating policy, more focused consultation with targeted stakeholder groups. Involves participatory governance, collaborative public management and consensus-building processes. A this stage, there is a shift from deliberation that occurred upstream to agreement-seeking processes. Collaborating midstream does not nullify competition between shared and different goals and, sometimes, it may lead to conflict. Criteria for successful outcomes includes: cost-effective implementation; financial feasibility; fair distribution of costs among parties; improved problem-solving capacity; enhanced social capital; reduction in conflict and hostility.

- 'Downstream' describes enforcing policy through quasi-judicial or judicial action. The main goal of this stage is to determine rights and responsibilities among a defined set of actors, e.g. alternative dispute resolution.

2.2.3 Metagovernance

As stated in the previous section, there are three main approaches to governance: hierarchical, market and network (Rhodes, 1996 and Jessop, 2011). These are the approaches most commonly adopted in policy. As public issues (e.g. environmental problems) become more complex in societies, Jessop (2011) argues that the three modes inevitably fail at dealing with issues such as these environmental problems. In order to overcome these inevitable and expected failures, the concept of metagovernance was created. Briefly, metagovernance is defined as the "governance of governance" (Jessop, 2011, p. 106). Meuleman (2008) expands this definition by stating that metagovernance is a "means by which to produce some degree of coordinated governance" (p. 68). He adds that coordination occurs through sound combinations of hierarchical, market and network governance to achieve the best possible outcomes.

Thus, metagovernance emerged as the instrument to cope with the unavoidable failure of governance approaches. It can also be viewed as the hierarchical supervision of networks and markets. It is involved in designating and managing mixtures of hierarchies, networks and markets. 'Mixture' is a key word because it recognises that the three governance modes are usually mixed, producing hybrid governance compositions that include markets, networks and hierarchy. Jessop (2011) argues that governance fails due to the problem of 'governability': "the question of whether a socially and discursively constituted object of governance could ever be manageable given the complexity and turbulence of the material, social, and spatiotemporal conditions in which it is embedded" (p. 9). And to specific issues of 'governability' that relate with the policy issue and the particular modes of coordination involved.

Following the performance-based perspective of governance adopted by this study, the role of metagovernance is to improve the effectiveness of governance, such as achieving better environmental outcomes. Jessop (2011) defines effective governance as the capacity (by the actors involved in the governance arrangements) to reflect on, and rebalance, the mix among the governance modes in response to the challenges and opportunities that occur in market, state and civil society realms. In other words, effective governance is the capacity to modify and readjust the mix of governance modes according to changes in the issue at hand, e.g. population growth, climate change or financial resources. Therefore adaptive governance is the best example of

effective governance.

However, Jessop (2011) warns that that achieving an ideal mix may be an impossible task. So far, there are no examples of how this mixture might be obtained. Jessop goes on to state "any impression of effective governance and metagovernance to date has depended on displacing certain governance problems elsewhere and/or on deferring them into a more or less remote future" (p. 12). Meuleman (2008), is more optimistic and argues that the right combinations between the three governance approaches can be achieved. This could be done by highly trained and skilful public managers or 'metagovernors'. One of the main tools of metagovernance is monitoring. Jessop's (2011) view is that this tool underpins flexibility, and provides essential information to modify the mix of the governance approach, e.g. more use of markets rather than hierarchy, supported by networks; or more use of hierarchy to steer the network.

2.3 Conceptual framework: Governance, policy & planning and implementation

The relationship between governance and policy and planning can be conceptualised as 1) governance as a policy and planning activity; 2) the role of the government in policy and planning, which involves steering and coordination; or 3) the actions/institutions that structure the policy process where planning is embedded. These three conceptualisations occur within a collaborative set where state and non-state actors participate in policy development and implementation. In the three conceptualisations, policy and planning are combined in one term, as planning is embedded into policy in the sense that it can be analysed through the policy cycle (Howlett and Ramesh, 1995). Moreover, this study characterises planning as a type of policy-making, and it analyses the impact of a governance approach (collaboration) through the environmental outcomes achieved by a water quality plan, which is a key element of a water quality policy (see Figure 2.1 for more detail). These three conceptualisations occur within a collaborative setting, where state and non-state actors participate in plan formulation and implementation. These three conceptualisations are described below.

1. Governance is considered to be a policy and planning activity, where governance is viewed as a strategy adopted by policy and planning to achieve its objectives. Planning is defined as "a systematic, integrative and iterative process that is

comprised of a number of steps executed over a specified time schedule" (European Commission, 2003 cited by Newig and Koontz, 2013, p. 252). In this respect, collaborative planning is defined as an "interactive process of consensus building and implementation using stakeholder and public involvement" (Margerum, 2002, p. 237). This conceptualisation of planning coincides with the notion of collaborative governance, defined by Ansell and Gash (2008) as "a governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programs or assets" (p. 544). Moreover, Ansell (2012) implicitly conceptualises planning as a form of governance activity as he divides collaborative governance in three types: collaborative planning, watershed partnerships and regulatory negotiation. This view is also shared by Healey (2006) which views "planning as a policy-driven approach to the practice of governance which is both knowledge-rich and inclusionary" (p. 241).

2. Role of government is considered within policy and planning, where governance can be viewed as the steering of policy and planning by government through the development and implementation phases, while policy and planning become forms of rowing service delivery. Adopting the neoliberal focus that views governance as a new mode of governing that reduces the state's role in formulating and implementing policies, where instead of 'rowing', it 'steers' service delivery (Rhodes, 1996), planning then becomes a collaborative activity that 'rows' the delivery of public goods. Governance, in this scheme, is the attempt to coordinate ('steer') vertically and horizontally the interactions that occur within collaborative planning (Newig and Koontz, 2013), which is considered part of the institutional capacity of a governance system that contributes to its effectiveness (Lockwood, 2010).

3. Governance is considered as a system comprised of institutions that structure the policy process in which planning is embedded. Planning can be seen as a public policy activity framed by the policy cycle (Newig and Koontz, 2013). In this view, governance becomes the system where policy processes such as planning take place. A governance system is understood as the government and other organisations that manage a resource; the specific rules related to the use of that

resource; and how these rules are made (Ostrom, 2009). This system structures the policy-making process by regulating, controlling, monitoring or coordinating through actions or institutions. Frameworks of analysis such as the Institutional Analysis and Development (IAD) framework (Ostrom, 1999; Ostrom, 2005) or the Advocacy Coalition Framework (ACF) (Sabatier and Jenkins-Smith, 1999) fit with this view of the governance and planning relation.
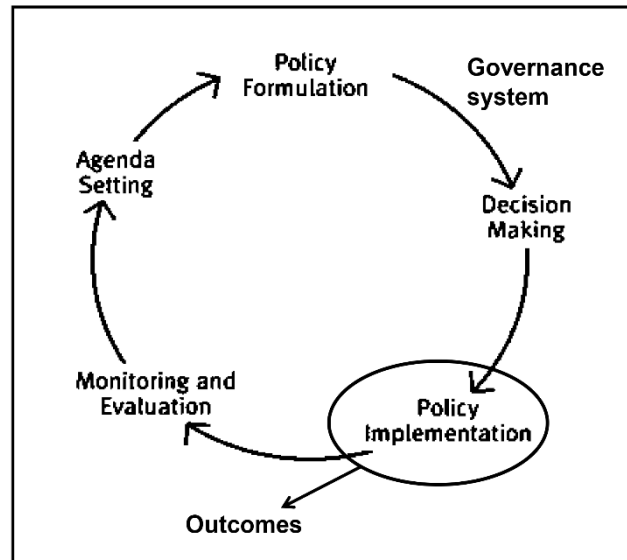
Figure 2.1 Visual representation of the interaction between the research topics: governance-policy&planning-implementation-outcomes).

The relationship between governance-policy and planning is complemented by implementation, which is the third element this research considers for the analysis of environmental outcomes (see Figure 2.2 for more detail). Implementation is defined as "the carrying out of a basic policy decision, usually made in a statute" (Sabatier and Mazmanian, 1980, p. 540). The policy decision identifies the problems to be addressed, the objectives to be pursued and structures the implementation process. Studies of implementation have remained marginal in the social sciences since the 1990s due to the rise of New Public Management (NPM) reforms (Barrett, 2004), leaving a wide research gap (O'Toole, 2000). As a consequence, there is still no robust implementation theory, which is also the result of a persistent debate between 'top-down' and 'bottom-up' schools of implementation research (deLeon and deLeon, 2002; Pulzl and Treib, 2007). Top-down focuses on the gap between policy definition and its execution, while

bottom-up studies the networks of actors involved directly in the implementation process (e.g. street-level bureaucrats). O'Toole (2000) and Pulzl and Treib (2007), on the other hand, argue that implementation research has continued under other labels, such as studies of policy change. Within these studies, 'hybrid' theories (i.e. attempts to reconcile top-down and bottom-up approaches) have been developed, such as the IAD or the ACF frameworks.

Governance

Collaborative governance

Top–down/Bottom–up implementation

Outcomes

Policy & Planning

Conformance/ Performance
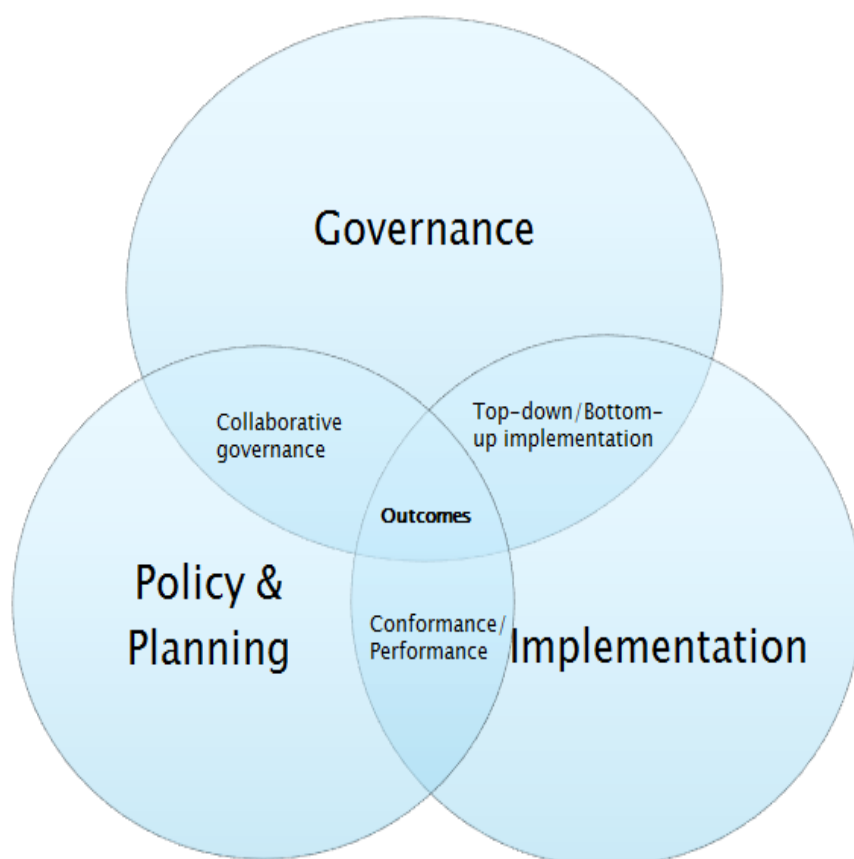
Implementation

Figure 2.2 Graphic representation of the relationship between governance-policy and planning- implementation.

According to O'Toole (2000), implementation is included in the broader theme of analysing how governance systems deliver policy outcomes. The link between governance and implementation is also implicit in the elements that, according to Sabatier and Mazmanian (1980), structures the implementation process. The ability to structure includes key governance components such as institutions, rules and resources as well as the ability to steer the implementation process and regulate public participation. Hill and Hupe (2003) argue that this analysis needs to consider the characteristics of the actors involved as well as their 'structured' relationships. Within

policy and planning, implementation is the phase that delivers the program through actions 'on the ground' directed to achieve the planning objectives: "implementation as a sub-process of the overall process in which policies are being made. It can be viewed as distinguished from the policy formation part of the policy process. The difference between the two parts is that implementation deals with policy goals that are given, being the result of the policy formation in which those goals were set" (Hill and Hupe, 2003, p. 485).

Plan and policy implementation can be approached as either 'conformance' to the actions contained in a plan or 'performance' according to how outcomes are affected by decisions (Berke et al., 2006). The assumption is that planning generates outcomes by implementing a set of objectives usually contained in a plan. The implementation occurs within a governance system that presumably relies on a mode (or modes) of governance to deliver the plan. Moreover, implementation questions were found to be the key aspect to understand the relationship between governance and planning outcomes. And O'Toole (2000) points out that this relationship remains a research gap. In a recent study of a collaborative effort (watershed partnerships), Koontz and Newig (2013) found that neither top-down or bottom-up approaches had a decisive influence in plan and policy implementation: other elements such as funds, leadership and networks were more important.

2.4 Governance frameworks

The frameworks reviewed in this study are used to guide and structure the analysis of how governance systems function in collaborative schemes and the outcomes they produce. Governance frameworks are defined as "the totality of instruments, procedures, processes and role division among actors designed to tackle a group of societal problems" (Meuleman and Niestroy, 2015, p. 7). They are a tool for understanding governance systems and their interaction between multiple variables and levels of analysis, highlighting the inherent complexity of the system: "purposive governance interventions that are developed and delivered by multiple actors at multiple scales in pursuit of a broad goal (i.e. the protection of biodiversity)" (Dale et al., 2013b, p. 164).

This thesis considered analytical frameworks suited to the analysis of multi-level and

polycentric governance systems. Multi-level describes the different levels of government involved in decision-making processes such as local, regional, state, national and international (Hooghe and Marks, 2003). 'Polycentric' refers to the multiplicity of centres of authority, in contrast with the traditional conception that views the state as the only centre. Polycentricism also implies that interactions are done vertically as well as horizontally across more than one jurisdiction, often overlapping or duplicating functions (Ostrom et al., 1961). Even though power is dispersed across many centres, the state remains the most powerful actor as it has the capacity to change the rules of the game and establish policy priorities (Bell and Hindmoor, 2009).

The frameworks reviewed are briefly presented according to their main purpose (for more details see the Appendix B):

- Explain policy change: IAD Framework (Ostrom, 1999; Ostrom, 2005; Imperial, 1999; Pahl Wostl et al., 2010); ACF (Sabatier and Jenkins-Smith, 1999; Kubler, 2001; Weible et al., 2011); Transition Management Framework (Loorbach, 2010); and the Management and Transition Framework which is based on elements of the IAD (Pahl Wostl et al., 2010).

- Offer diagnosis or model approaches: Governance and Systems Analysis (GSA) (Dale et al., 2013b); General Framework for Analyzing Sustainability of Social-Ecological Systems (Ostrom, 2009); and Integrative Framework for Collaborative Governance (Emerson et al., 2012).

- Analyse appropriateness or suitability: Governance strategies that effectively support ecosystem services, resource sustainability, and biodiversity (Kenward et al., 2011); and Fit-for-purpose Governance (Rijke et al., 2012).

- Analyse outcomes: Goal specificity (Biddle and Koontz, 2014); Framework for monitoring social process and outcomes (Chapman, 2014); and Framework for evaluating and designing collaborative planning (Faehnle and Tyrvainen, 2013).

- Examine the impact of governance on programs or policies: Governance Analytical Framework (GAF) (Hufty, 2011).

Most of the frameworks reviewed include general interdisciplinary criteria that can be

applied to any field or policy area. The majority assess processes or governance outcomes, focusing on the overall performance of the governance system. Few, however, concentrate on the final results or outcomes of the plan or policy such as environmental and social outcomes. By governance outcomes and processes, I refer to aspects such as inclusiveness, transparency, fairness, accountability, legitimacy or knowledge use (Dale et al., 2013b; and Vella et al., 2015) as well as 'good governance' principles (Lockwood et al., 2010), which overlap with the governance outcomes and processes enlisted above. On the other hand, environmental outcomes refer to results such as the improvement in the quality of water (percentage against target) or the reduction in land degradation. Examples of social outcomes could be levels of social learning or value of ecosystem services (Chapman, 2014).

The focus of this research is on environmental policy and planning and seeks to address the research gap of how governance in its collaborative approach impacts on environmental outcomes. This leaves aside analysis regarding the quality of governance processes and how they ought to operate according to a set of 'good governance' principles. It also does not consider explaining policy change or analysing the suitability or appropriateness of governance strategies. Also out of scope of this study is the analysis of the impact of governance on other type of outcomes, such as social benefits, and informing reforms to the overall governance system. The research represents the analysis of the impact of collaborative governance processes on only one category of outcomes, the environmental outcomes.

Two governance frameworks were considered to be suitable for this type of study: the GAF (Figure 2.3) and the Process-Outcomes governance framework (Figure 2.4). The GAF is designed to analyse the impact that governance has upon a selected dependent variable, e.g. equity. It assumes a cause-effect relationship between governance and the dependent variable selected. The relationship, nonetheless, is preceded by contextual conditions, identified by Hufty (2011) as independent variables. Governance then adopts more a mediating role, conducting (and altering) the causes of the context on the effects of the dependent variable examined. The Process-Outcomes framework also evaluates the impact of governance on outcomes (designed as consequences in the framework's perspective), and assumes a mediating role for governance as well. While both are suitable for the analysis of this study, the GAF seems more appropriate for an analysis that focuses on social outcomes (e.g. trust and relationship building) as

it involves network analysis of collaborations. The Process-Outcomes governance framework, on the other hand, has the advantage of synthesising both a process and outcome-oriented evaluation of governance in the environmental context. In this project, I examine both as I assess aspects and elements of the collaborative governance process and link them to their impact on the environmental outcomes achieved by a water policy. Hence, the Process-Outcomes governance framework was found more suitable and, consequently, was selected for this study. More details about this framework are provided in the Research Methodology section of this thesis (Chapter 3).
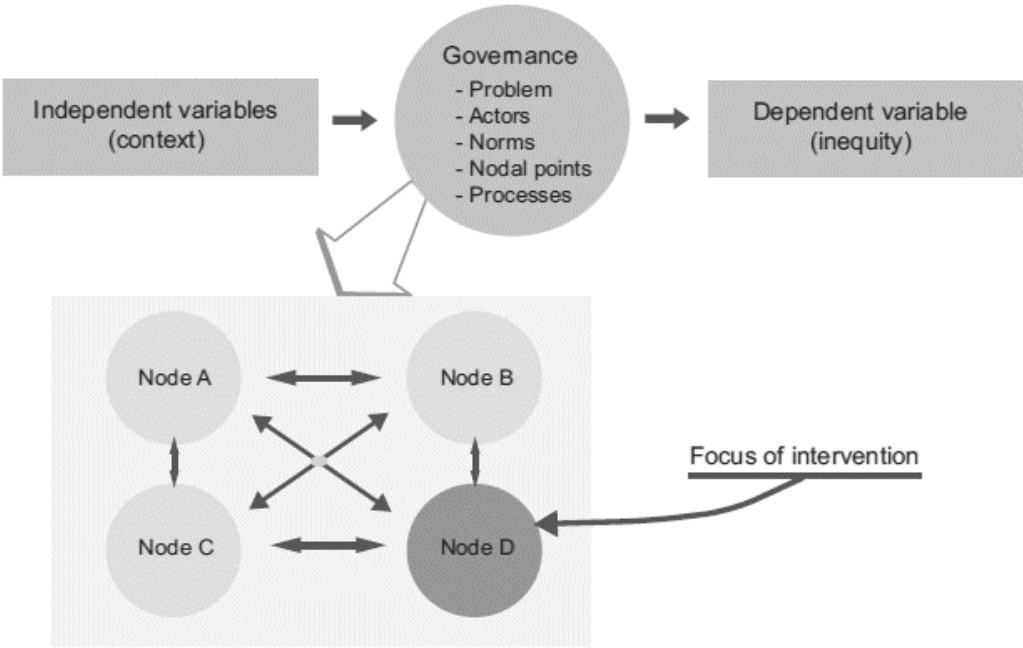
Figure 2.3 Governance Analytical Framework by Hufty (2011).
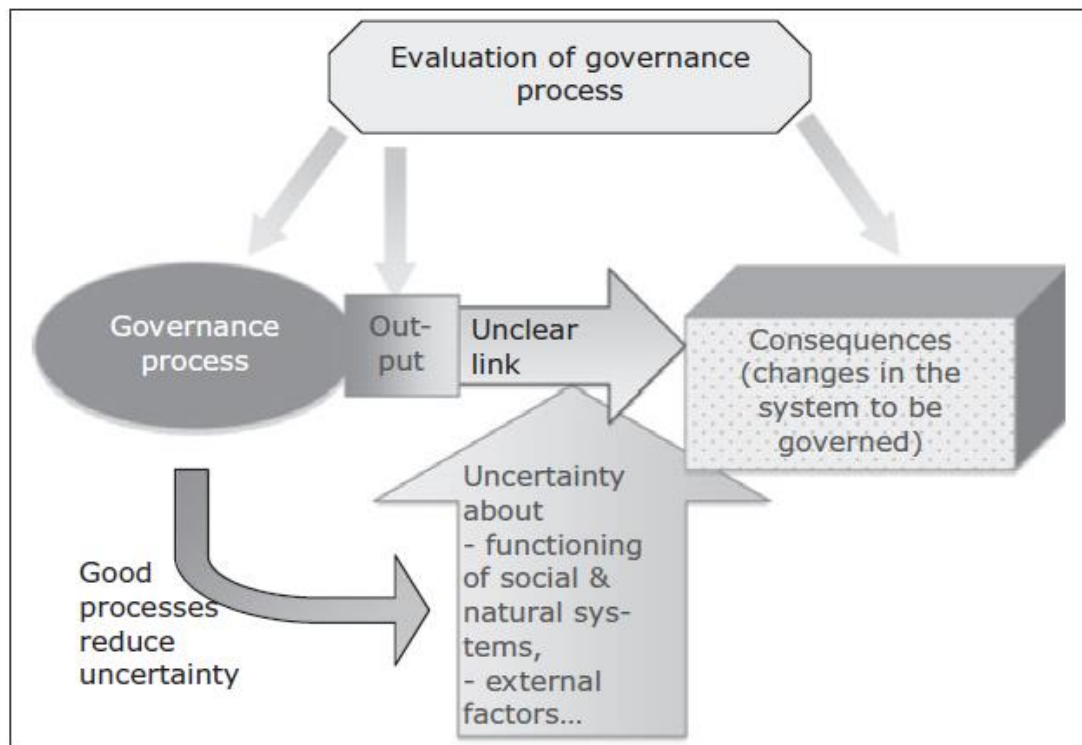
Figure 2.4 Process-Outcomes governance evaluation framework by Rauschmayer et al. (2009).

2.5 Australian model of environmental governance

In Australia, collaborative governance approaches to policy and planning emerged from rural land and water management approaches. In the late 1980s and early 1990s, the states of New South Wales and Queensland initiated integrated catchment management efforts to improve the sustainability of land and water resources (Margerum, 2002). These integrated management efforts evolved into the current regional NRM model for improving the management of natural resources. The regional environmental governance model was introduced in 2002 by the Australian government in conjunction with the State and Territory governments through the National Action Plan for Salinity and Water Quality (NAP) (Curtis et al., 2014). Operating this model involved the creation of 56 NRM regions in the country, which were administered and managed by the same number of community-based NRM bodies. In Queensland, the location of the study area, the governments established 14 NRM regions. One purpose of the NRM bodies was to develop and implement NRM plans as well as well as water quality plans in collaboration with community groups and governments (Lockwood et al., 2009). The key stakeholders included in the collaborative form of governance were the three levels of government (federal, state and local); industry groups (e.g. agriculture, dairy farming

or mining); community-based groups, including indigenous representation; research institutions; and Regional Development Australia (RDA) committees (Cox et al., 2013). NRM based on regions was considered the best way to achieve integrated outcomes (Vella et al., 2015).

The regional model, nonetheless, has received some criticisms. For instance, Curtis et al. (2014) argue that the government favours the neoliberal approach (on the grounds of efficiency) of purchasing outcomes from the landholders — viewing them and the NRM groups as instruments of implementation (delivery of services) — instead of building human and social capital that would generate better results. This view is shared by Marshall (2007). It has also been criticised in terms of its legitimacy, democracy and accountability; however, it is perceived by most of the stakeholders (including Indigenous communities) as the preferred approach to NRM delivery (Robins and Kanowski, 2011). The regional model was initially created as a bottom-up governance approach to NRM and planning but in practice it has been instrumented through a top-down model controlled by federal and state governments (Robins and Dovers, 2007a). See Table 2.2 for more detail about the evolution of Australian environmental governance. This review has identified that solving the tension between regional approaches is one of the main governance challenges for the regional model.

The NAP was included as part of the Natural Heritage Trust (NHT) program which allocated A$392 million to the 56 regions (Robins and Dovers, 2007a). They were replaced in 2008 by the Caring for our Country (CfoC) program that marked a shift from the bi-partisan agreement between state and federal governments to a more centralised control from the federal level. The bi-partisan model was crucial for the appropriate operation of the regional model as it secured support and funds (Lockwood and Davidson, 2010 and Vella et al., 2015). CfoC undermined community engagement and widened the gap between local groups and regional bodies. Moreover, it reduced the trust of the regional participants towards the government and its commitment to NRM, which was followed by large cuts in state government expenditure (Curtis et al., 2014). One of the main policies of the CfoC, and the focus of this study, was the *2009 Reef Plan*, along with its *Reef Rescue* implementation strategy. They were both representatives of this move to more hierarchical governance, as argued by Curtis et al. (2014).

Table 2.2 Paradigm shifts in NRM, adapted from Robins (2007).

1.	Landcare	Created in 1990 by the Australian government after the strong lobby from the Australian Conservation Foundation (ACF) and the National Farmers' Federation (NFF). In four years, more than 2000 Landcare groups were formed throughout the country, representing one third of all the farming families.
2.	Integrated Catchment Management	Described as a philosophy-organisational culture; a process-collaboration between government and community; and a product-making and implementing a plan. Catchments were the unit of water and land management in the mid-1990s (following the British approach). This paradigm emphasises community engagement in the decision-making process.
3.	Sustainable development	The concept of 'sustainable development' found favour with the Australian Labour Party. It signified a greater interest and influence of the Australian government in NRM, which followed the ideas and guidelines expressed in the Rio Earth Summit of 1992 and Agenda 21. The negative aspect of this, which had consequences for the next paradigm, is the failure of Australia in ratifying the Kyoto Protocol on climate change.
4.	Neoliberalism	Characterised by economic aims such as privatisation; public-private partnerships governance modes; and market-based instruments. Marked the rise of government business plans that prioritised monitoring performance and strict reporting arrangements. NHT was created in this paradigm, seen as a community-based funding program.
5.	Regionalism	Signalled by the tension between two trends, 'regionalisation' and 'regionalism'. In the Australian experience, governments have been more willing to devolve responsibilities to regions for program management and delivery, than to provide the necessary power and resources. It is represented by the NHT2 and the NAP.

The funding mechanism of the CfoC reduced the financial autonomy, and therefore the power of the regional NRM groups, leading to uncertainty and instability that has been ameliorated through alternative sources such as selling technical services (Robins and Kanowski, 2011). The shift to a more centralised model has been deepened by the current (introduced in 2013) Regional NRM Planning for Climate Change program which oversees the planning process of a new NRM plan by determining the priorities, assigning funds and endorsing the final document (Australian Government, 2014b). It is important to note that NRM issues have low priority in the federal government agenda. For instance, NHT2 and NAP which have been allocated the highest funding, represented just 0.1% of the federal budget. Hence, regional bodies have limited influence on high-level political and bureaucratic negotiations (Robins and Dovers, 2007b).

The thesis focuses on the state of Queensland, where the regional NRM model follows a collaborative and community-based mode of governance, which was introduced by

the Commonwealth in 2001 through the NAP (Lockwood et al., 2009; and Vella et al., 2015). This plan complemented the second phase of the Natural Heritage Trust (NHT2) program. In Queensland, the NRM regional bodies are non-profit and have non-statutory or 'community owned' governance arrangements. This means that the bodies are owned by communities, which renders them a degree of flexibility to negotiate their priorities with governments, from local, state and federal levels. Non-statutory also means that these organizations have a degree of freedom to obtain funding. For instance, they can engage in profitable practices, such as offering consultancy services or negotiate funding sources from non-government actors. Aside from that, non-statutory implies that the plans and policies of the regional NRM bodies in Queensland lack mandatory or enforceable actions (Ryan et al, 2013). The levels of freedom and flexibility offered by the non-statutory condition translate into a 'loose' nature of their governance arrangements. Queensland, though, is not the only state with this type of regional NRM model. Western Australia and the Northern Territory are the other Australian states with community owned or non-statutory regional NRM bodies.

In New South Wales, Victoria, Tasmania and South Australia, the governance arrangements of the regional NRM bodies are 'tighter'. In these states, the bodies are non-profit and statutory organizations. This means that these organizations are owned by the state governments, who define their nature as well as their plans and policies (Ryan et al, 2013). In this regard, they lack the level of flexibility to negotiate their priorities as they are usually defined by statue or government guidelines. They also lack the degree of freedom to obtain funding as it is provided by the state governments. On the other hand, the statutory nature of these organizations means that some (not all) of the actions in their plans and policies are mandatory. Table 2.3 below shows the nature of the governance arrangements and number of regional NRM bodies in Australia. It is worth noting that the statutory or non-statutory nature of the governance arrangements has not made any significant difference in terms of the outcomes (i.e. environmental outcomes) achieved by the regional NRM bodies (Ryan et al., 2013).

Table 2.3 Classification of the 54 regional NRM bodies in Australia (adapted from Ryan et al., 2013).

State or Territory	Regional NRM bodies	Governance arrangements
Australian Capital Territory	1	Non-statutory but government appointed
New South Wales	11	Statutory
Northern Territory	1	Non-statutory
Queensland	14	Non-statutory
Tasmania	3	Statutory
South Australia	8	Statutory
Victoria	10	Statutory
Western Australia	6	Non-statutory

In general, the role of the regional NRM groups in Queensland is to engage stakeholders and the wider public in the development of regional NRM plans that establish regional priorities to guide the investment of public resources (Curtis et al., 2014). The regional groups are embedded within a governance system which, according to Lane and McDonald (2005), has the following institutional arrangements:

- decentralisation of government agencies and institutions

- devolution of responsibility for development and implementation of policies to local communities and non-state organisations

- enabling of local participation in planning as a more effective and context-sensitive mode of planning.

The collaborative mode is considered a more adequate approach to plan implementation as it is done through the participation of local communities: yet there is no strong evidence to confirm this assumption. Nonetheless, collaboration is crucial in this model as its main purpose is to confer legitimacy to plans and decisions (Lane and McDonald, 2005). The feature of these arrangements is use of a 'bottom-up' approach for NRM planning, in which the community and local level determine the course of action that are followed by the other upper levels; however, the regional model is characterised by a 'hybridisation' of governance approaches. It combines 'bottom-up' and 'top-down' elements, where devolution of responsibility does not involve power sharing, in line with the neoliberal ideology towards the provision of public goods by private actors (Lockwood and Davidson, 2010). Currently, the approach has moved more towards the centralisation of decisions at the federal level (Australian Government, 2015a). The

main tension within the model is that this community-based collaborative governance is facilitated by the central level, which oversees the process and accredits its outcomes.

2.6 Conclusion

In this chapter, I presented the performance-oriented perspective on governance adopted in this study, where the aim of governance is to solve problems and improve well-being and life quality. In this view, governance is considered as a process that delivers solutions to public issues. I described how this study focuses on the collaborative approach of governance and offered the definition that frames my research. Collaborative governance is the approach followed by the case study. After outlining the concept of governance to its collaborative mode, I explained the conceptual framework of my research, integrated by four concepts that refer to environmental governance: 1) governance; 2) policy and planning; 3) implementation; and 3) outcomes. I showed how these concepts interact within my study, using the policy-making cycle to state the focus of the study, which analyses governance at the implementation phase of policy-making, which is the phase where outcomes (i.e. environmental outcomes) are produced.

Then, I presented the review of governance frameworks that I undertook in order to select the governance framework that is most appropriate to examine the research problem and use in the case study. I explained how the Process-Outcomes governance evaluation framework was the best fit for the purpose of this research. This framework is further described and explained in the Research Methodology section (next chapter).

Finally, I briefly outlined the Australian environmental governance model, which is the area of focus for my study. The model is characterised by a regionalisation strategy that has become increasingly centralised over the years, despite the collaborative approach adopted.

The next section presents the research methodology adopted in the research: it describes the steps followed to undertake the study of the impact of governance in its collaborative approach on environmental outcomes within a water quality plan.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

The methodology conforms the ways of obtaining knowledge about the real world (Biesbroek, 2014). Environmental problems are complex and, in consequence, researching them is also a complex task. For this reason, the methodology to analyse the impact of collaborative governance on environmental outcomes is based on an interdisciplinary mixed methods research approach that combines quantitative and qualitative methods of data collection and analysis. The research methodology of this study consists of two phases (Figure 3.1): firstly, the development of a modified Process-Outcomes governance evaluation framework, based on a critical literature review of previous studies that have examined the impact of collaboration on environmental outcomes; secondly, the case study analysis, which applies the framework to examine the impact of collaborative governance on environmental outcomes. The first phase provides the conceptual and theoretical tools to undertake the case study analysis. In the second phase, the Process-Outcomes governance framework is applied along with the collaborative governance criteria to evaluate collaboration based on environmental outcomes achieved. The framework implementation combined a regional evaluation undertaken at the regional scale of collaborative governance, and a general evaluation that included the other levels of governance involved in the water quality plan.

This section proceeds by firstly presenting the research perspective adopted to investigate the research problem. Then, it offers the research design that consists in a set of objectives developed to address the research sub-questions. This section also explains the research approach followed as well as the process for case study selection. It also includes the explanation and justification behind the selection of the governance evaluation framework presented in Chapter 2. The chapter is complemented by a description of the data collection methods, as well as the steps followed for data processing and analysis, which served as the basis for the results chapters. It concludes with a summary of the research methodology.
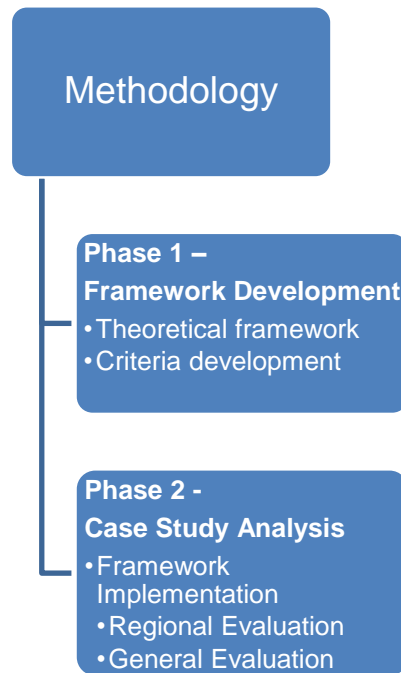
Figure 3.1 The two phases of the research methodology.

3.2 Research perspective (the ontological and epistemological approach)

Ontologically, the research assumes that reality is objective and, therefore, can be knowable. In consequence, the study adopts a pragmatist research perspective or philosophical worldview. Worldview is defined as "a basic set of beliefs that guide action" (Guba, 1990, p. 17). These beliefs are represented by the epistemology of the pragmatist approach, which is problem-oriented and investigates the consequences or impacts of actions in solving a given problem. Epistemology refers to how we get to know about reality. Pragmatism is oriented to real world practice and performance (Creswell, 2014). This pragmatic view is exemplified in this research by the adoption of a performance-oriented perspective of governance to investigate how a collaborative governance approach impacted in solving a water quality problem. The investigation around the governance approach impact is based on the results (e.g. environmental outcomes) achieved by a policy.

The pragmatist view is reinforced by the main concern of this study, which seeks to find out what works in the collaborative approach, and how it contributes to the solution of the environmental issue studied. This also explains why this research does not engage with making normative judgements about 'good' or 'bad' performance. For this reason, the study does not rely on 'good governance' principles. In addition, it evaluates how

collaborative governance works in practice rather than discussing its theoretical merits. In this regard, the study emphasises, following Creswell (2014), the research problem instead of the methods. The examination of the impacts of a governance approach represents a way to better understand an environmental issue, in this case water quality. The pragmatist perspective also accounts for why the study adopted a mixed methods research approach. As pragmatists do not commit to one reality and do not see the world as an absolute unity, they adopt varied approaches to analyse and collect data in order to provide a better understanding of the research problem (Creswell, 2014).

The pragmatist view is complemented by an epistemological post-positivist position that assumes that there is an objective reality that can be studied, while adopting a deterministic philosophy where certain causes determine or influence outcomes (Creswell, 2014). This post-positivist view is exemplified by the epistemological approach of this study, which investigates the impacts of an independent variable (collaborative governance) on a dependent variable (environmental outcomes). The post-positivist view guides the quantitative aspect of the study, involved in developing numeric measures to study the impact of collaborative governance. It uses the deductive method to specify important variables and makes comparisons among groups (Lincoln et al., 2011). This is, after all, the purpose of developing and using an evaluation framework to assess the impact of governance on environmental outcomes. However, the study does not adopt fully the post-positive stance as it does not seek to validate a theory or reduce the interpretation of the results to a cause-effect relationship, explained merely by numbers (Creswell, 2014).

As this is essentially a social science research (e.g. study of human decisions and interactions), the researcher avoids assuming a reductionist position to explain the phenomena studied. In this regard, the study accepts the partial nature of the investigation, highlighting that governance does not explain completely the environmental outcomes achieved by a given policy or plan. Given its post-positivist stance, this study marginalises the mental processes or internal volition of individuals as a study subject (Neuman, 2011). Furthermore, this research does not rely on critical science approaches. Thus, it does not seek to empower a particular group from the findings of the governance analysis nor does it intend to serve as an instrument to reduce domination or power distinctions (Neuman, 2011).

3.3. Research design

The plan to undertake the research was guided by the main research questions and the four research sub-questions. As stated in the Introduction chapter, the research sought to respond to the primary research question of *how has collaborative governance impacted on environmental outcomes in Australian natural resource planning and management?* Following this main research question, the research developed three objectives to organise the research sub-questions and structure the data collection and data analysis tasks to address the sub-questions. This provided a frame of reference to undertake the research activities. Among the research sub-questions, the research included the questions that guided the critical literature review (Chapter 4).

Objective 1: Identify frameworks and criteria that underpin evaluation of collaborative governance approaches on environmental outcomes.

1. Based on the environmental outcomes achieved, have collaborative forms of governance improved the condition of natural resources?

Objective 2: Apply a case study analysis to evaluate the impact of collaborative governance on environmental outcomes within Australia.

1. What was the role of collaboration in the implementation of the *2009 Reef Plan*?

2. How have regional collaborative governance approaches impacted on environmental outcomes achieved by the NRM regions of the GBR?

3. What are the strengths and weaknesses of the collaborative governance approach?

Objective 3: Develop a series of recommendations from the case study analysis.

1. What are the implications of collaborative governance in Queensland's natural resource planning and management?

As I stated in the introduction of this chapter, environmental issues are complex and their investigation involves also complex methods. Hence, this research relies on a case study, which is used in social sciences to understand complex phenomena (Gilgun, 1994). Moreover, this approach is recommended for research designed to ask the "how" of particular phenomena in real world contexts (Punch, 1998). The next section explains

the case study approach and highlights its pertinence for the research undertaken in this thesis.

3.3.1 Research approach

The study uses a mixed methods research approach that relies on a case study research strategy. The mixed methods approach was selected because combining quantitative and qualitative approaches provides a more complete understanding of a research problem (Creswell, 2014). The case study was selected as the research approach as this research seeks to answer "what" and "how" about governance and its impact on environmental outcomes within environmental planning and policy. As Yin (2014) argues, in his seminal work, the case study is the most appropriate research approach to answer "how" or "why" questions about contemporary events in which the researcher has little or no control. The case study also fits with the research perspectives (pragmatist and post-positivist) adopted in this study, as this research approach assumes the existence of an objective reality that is independent of the observer (Yin, 2014).

Case study research has been criticised as being unable to provide general, context-independent knowledge. Generalisable knowledge that does not depend on a given context tends to be considered more valuable than context-dependent knowledge. Flyvbjerg (2006) argues that this is a misunderstanding on the validity of case study as a scientific method. Case study research provides "concrete, practical and context-dependent knowledge" (Flyvbjerg, 2006, p. 224). Thus, it provides a more complete picture of the phenomenon under investigation. In this way, the case study strategy of investigating a governance approach within environmental policy and planning provides practical and concrete knowledge of its impacts on the solution of an environmental issue. In addition, the case study has the advantage of including the context that tends to be disregarded by other research strategies, particularly those that are quantitative-oriented. As governance occurs in human decisions and actions, it is essential to take into account the context in which these actions and decisions occur.

In the application of case study research — to provide a wider picture of a phenomenon — the researcher acts in a similar fashion to a detective. Yin (2014) argues that analysing past events is analogous to arriving on a scene after a crime. It is important to note that generally case study research involves examining past events. Yin (2014)

adds that case study research does not imply studying the 'dead past'. On the contrary, it is the study of "a contemporary phenomenon in its real-world context" (Yin, 2014, p. 78). Flyvbjerg (2006) adds that case study research is pertinent when past events under investigation are critical to understand a general problem. The task of the detective-researcher is to make inferences about what has happened.

In the case of this research, the task is to find out and infer on the impacts of a collaborative governance approach on the environmental outcomes achieved by an environmental policy. Important to note is that the inferences do not depend on the researcher's judgements, but rather on the evidence gathered from the witnesses (i.e. interviewees) and from the physical elements of the scene (i.e. documents, plans and policies). In addition, and this is the most difficult element, the inferences also depend on some "unspecifiable element of common sense" (Yin, 2014, p. 76). The "common sense" in this study is guided by the pragmatist and post-positivist research perspective, where the researcher offers an account of what occurred and what can be improved to solve the water quality problem investigated.

3.3.2 Case study selection criteria

The selection of the single case study was based on four criteria. First, the selection focused on an environmental issue that was significant in scale and magnitude, but also that remained unsolved. The scale referred to the geographic area covered by the environmental issue as well as the multiplicity of actors involved. The magnitude referred to the level of impact of the environmental issue on nature as well as on the stakeholders. The water quality issue in the GBR fit with this first criterion, as its scale covered more than one area (i.e. six NRM regions within the same state jurisdiction) and involved multiple actors from government, community and industry sectors. In terms of magnitude, water quality impacted on one of the largest and most biodiverse reef ecosystems in the world, affecting multiple stakeholders with different interests and aims. In addition, the water quality issue remains a pressing issue despite varied efforts to solve it (Chapter 1).

The six NRM regions within the GBR also serves to explain why a single case study was selected instead of two or more. In this regard, this is a unique single case study because it integrates six different small cases: the six regions involved in the GBR's water quality issue. This unique single case study attempts to offer a more complete

picture of the phenomena under investigation. Particularly, by offering a deeper discussion through the six sub-cases, in an example of what Geertz (1983) describes as a 'thick description' of the phenomena investigated.

The third criterion was to select an environmental policy that relied on a collaborative governance approach within Australia. The main objective of this policy would be to improve the condition of a natural resource, given the focus of this study on environmental outcomes. The policy context had to be located in Australia as this research was funded by an Australian Research Council grant, and so this case study could focus on analysing the impact of governance on natural resource management and planning. The GBR water quality policies fit with this criterion, as they relied on collaborative governance approaches to improve water quality.

Finally, the fourth criterion was to select a water quality policy that had information on water quality outcomes and had a time-frame determined. The *2009 Reef Plan* was the policy that fit this criterion as its water quality outcomes were reported every year until it concluded in 2013. The data on these water quality outcomes was based on a monitoring and modelling program (the Paddock to Reef program) established to monitor the implementation progress of the water quality plan. These water quality outcomes would allow the examination of the impact of collaborative governance on them. They represented a benchmark in which to base the analysis of the impact of collaborative governance in the implementation of the Reef Plan.

The selection of this water quality plan was preceded by the identification of a monitoring gap based on a review of policies suitable for the purpose of this study. During this review, it was identified that other NRM plans in significant ecosystems lacked information about environmental outcomes, and did not include specific time-frames in their objectives and targets. In addition, previous water quality plans for the GBR lacked data on water quality outcomes, while more current ones did not fit this criterion as they were still being implemented and, therefore, their time-frame had not concluded.

Therefore, as the GBR water quality issue represented by the *2009 Reef Plan* fitted with these three criteria, it became then the single-case study for this research.

3.3.3 Process-Outcome governance evaluation framework

This study represents an ex-post evaluation of the impact of collaborative governance

arrangements and processes on environmental outcomes. Evaluations are defined as the "assessment of the merit, worth and value of administration, output and outcome of government interventions, which is intended to play a role in future, practical action situations" (Mickwitz, 2003, p. 420). By focusing on past natural resource planning and management events, this study seeks to determine to what extent collaboration efforts contributed to improve the condition of natural resources. Ex-post evaluations fit with one of the two types of evaluations –ex-ante and ex-post− required by environmental policy, as highlighted by Mickwitz (2003). My project represents an ex-post evaluation of the effectiveness of collaborative governance arrangements in improving environmental outcomes.

The analytical framework to evaluate governance was selected from a review of governance frameworks (Chapter 2). The Process-Outcomes governance framework (Rauschmayer et al, 2009) was considered the most appropriate analytical tool for the purpose of this study. Firstly, it was the only framework from the review that combined governance processes and the outcomes generated by the governance interventions, such as environmental outcomes. (See the Appendix B for more detail on the review of governance frameworks.) In this regard, it has the elements to analyse the setting of the *2009 Reef Plan* implementation, i.e. governance processes; outputs; consequences; and contextual conditions such as external factors. (See Chapter 2. Figure 2.4 for more detail on the elements of the framework.) Secondly, processes and outcomes to evaluate governance interventions allow learning about the obstacles to implementation that emerge from the governance processes (Rauschmayer et al., 2009). This contributes to address a knowledge gap of what occurs between the governance processes and the subsequent outcomes, thus reducing the uncertainty that pervades the relationship between governance efforts in policy and planning and the resultant outcomes. As this study focuses on the implementation of a water quality plan, the Process-Outcomes governance framework allows identifying the obstacles faced by its implementation. This also enables informing policy about improvements required to address the implementation obstacles.

Finally, the process-outcomes combined orientation to evaluation contributes to assessing the effectiveness of a governance intervention, based on the outcomes achieved. Effectiveness can be assessed by the ecological state achieved after the governance intervention (Rauschmayer et al., 2009), which can be viewed by comparing

the original targets of a policy or plan with the environmental outcomes achieved. In the case of this study, effectiveness is given by the water quality condition achieved after the collaborative governance intervention of the *Reef Plan* (contrasted between water quality targets and outcomes). Hence, the Process-Outcomes governance framework allows tracking the impact of the governance processes on the environmental outcomes achieved. This enables to identify obstacles generated by the processes and offers a picture on the effectiveness of the governance approach evaluated.

The Process-Outcomes governance framework is modified to fit this study. As a consequence, the environmental outcomes represent the water quality outcomes achieved by the *2009 Reef Plan*, the output is the water quality plan itself, and the governance processes examined are obtained through a review of other studies that have focused on collaborative governance and its impact on environmental outcomes. These are the collaborative governance processes criteria on which to base the evaluation of the *2009 Reef Plan* (Chapter 4). It is important to state that the Process-Outcomes governance framework is used to guide data collection and analysis of one part of the case study. The other represents, as stated previously, a quantitative analysis about the impacts of collaboration at the regional level. This other part of the case study, nonetheless, is framed by the Process-Outcomes governance framework. It is important to note that this modified framework would not constitute a model of collaboration, or an ideal type of what collaborative approaches should be. Rather it represents a diagnostic tool to support adjustments in governance arrangements, as well as inform future planning policies.

3.3.4 Data collection

Primary and secondary data were the two types of data collected to answer the research sub-questions. The primary data was based on semi-structured interviews with key stakeholders as well as an evaluation instrument responded to by the same. Secondary data was based on official water quality data reported, other government reports, documents from the NRM bodies (e.g. annual reports and newsletters), official and independent audits or evaluations as well as related literature (e.g. journal articles or books). Table 3.1 below shows in detail the type of data collected in this study, based on the six main sources of data for case study research (Yin, 2014).

Table 3.1 Data sources for the case study, based on main data sources of data (Yin 2014)

Source	Used	Not used
Documentation (Secondary data)	Official documents and reports from government agencies and regional NRM bodies (plans and policies, reports, report cards, brochures); evaluations or audits of plans; journal articles; books; research reports.	
Archival records (Secondary data)	NRM bodies annual reports (2008-2013). NRM bodies newsletters (2008-2013). Maps and charts of geographic characteristics of the place.	
Interviews / evaluation instrument (Primary data)	22 key stakeholders.	
Direct observations		X
Participant observation		X
Physical artefacts		X

The data collected was based on the four principles for data collection developed by Yin (2014). These principles increase validity and reliability of the study:

1. *Use multiple sources of evidence*: Yin (2014) recommends triangulating information sources, in order to develop "converging lines of inquiry" (p. 120) to corroborate the findings. Triangulation means that the case study findings have been supported by more than one source of data (known as convergent evidence). This is shown by the multiple sources of data outlined in Table 3.1 covered by primary and secondary data sources. This is also supported by Mickwitz (2003).

2. *Create a case study database*: the database contains four components:

    a. Notes: from interviews, document analysis and observations. The researcher included notes from interviews and document analysis using Word and NVivo software.

    b. Documents: collected during the case study (e.g. official reports). The researcher developed an annotated bibliography of these documents using EndNote software.

c. Tabular materials: surveys or quantitative data. In this study, they refer to the data on water quality outcomes as well as the evaluation instrument designed to be responded by the interviewees.

d. Narratives: answers to the research questions using the multiple sources of data. This creates a narrative that becomes the structure of the thesis

3. *Maintain a chain of evidence*: this chain provides the logical evidence to trace the steps followed by the researcher form the research questions to the conclusions or from the latter to the questions. Following the detective analogy, this is similar to the chain in criminological evidence. The chain of evidence in this study is given by the three objectives and the steps followed to address them. These steps comprised four elements with their respective activities: 1) tasks; 2) data collection; 3) data analysis; and 4) expected outcomes. (See Appendix A for more detail on this chart of objectives.)

4. *Exercise care when using data from electronic sources*: the researcher set limits to its use, relying only on information provided by official websites, avoiding newspaper sources or other sources such as blogs.

3.3.4.1 Data gathering methods

As mentioned previously, this study is based on a mixed methods research approach that combines quantitative and qualitative methods of data collection. The fieldwork was done from November 2016 to April 2017, and was preceded by a scoping analysis to identify the key stakeholders. Both quantitative and qualitative methods were used to collect the data sources presented in Table 3.1. The following subsections present in more detail each data gathering method, identifying the quantitative and qualitative methods.

Document review

This was a qualitative method of collecting data that was done through desktop analysis (not fieldwork). It involved first the literature review (Chapter 4) to develop the collaborative governance processes criteria added to the Process-Outcomes governance framework. The document review then focused on collating information from the official *2009 Reef Plan* (objectives, goals, water quality targets, governance

arrangements and main stakeholders involved); the report cards on water quality outcomes achieved year by year from 2008 to 2013; and previous evaluation reports on the plan (official and independent). This allowed identifying the role attributed to collaborative governance, understanding the water quality outcomes achieved as well as the collaborative implementation arrangements that took place during the implementation of the 2009 Reef Plan. At this point, the regional level of governance was identified as the most important for the implementation of the water quality plan.

Afterwards, the review focused on the NRM bodies which were the organisations that administered the implementation of the 2009 Reef Plan in the NRM regions of the GBR. This review focused on the characteristics of each NRM body and region in order to understand their specific governance structures and arrangements as well as the nature of the water quality problem in each NRM region. The review collated information from the NRM bodies' annual reports, newsletters and other reports on their websites such as the achievements reported to the 2009 Reef Plan within the Reef Rescue scheme. While most of the information was available on websites, in some cases the organisation contacted by email to obtain this type of information.

This review also helped the researcher to understand the background of the case study as well as providing guidance on how to address the research questions. For instance, by identifying the importance of the regional level, the researcher decided to explore this level in more detail by focusing on the impact of the regional NRM bodies' collaborative approaches on water quarter quality outcomes achieved.

Interviews

Interviews were the other qualitative method of data collection. Interviews served to complement the information obtained from the document review. The perceptions gathered via interview were important to explain, clarify and expand on aspects of collaboration in the implementation of the *2009 Reef Plan*. The interview was an essential instrument to contrast different views as well as strengthen the evidence for the case study analysis. The participants were divided into six groups, according to the formal stakeholders that participated in the Reef Plan: 1) federal government officials; 2) state government officials; 3) NRM body managers; 4) agriculture industry representatives; 5) conservation leaders; and 6) academics.

The researcher used a purposive approach to sampling as well as the snowball technique to select the participants for the interviews. Purposive sampling uses samples in a deliberate manner (Yin, 2014). This approach was fused because it permitted selecting the people with more experience and knowledge about the 2009 Reef Plan in each of the six stakeholder groups. The different affiliation of the participants given by their stakeholder groups would also guarantee avoiding biases (or the appearance of them) in the evidence (Yin, 2014). Moreover, their different backgrounds would provide contrasting evidence that would not be obtained if the research focused only on one or two stakeholder groups.

Purposive sampling was complemented by the snowball technique. Snowball is the analogy used to illustrate the method of selecting participants who were nominated by other participants based on their social networks and potential knowledge contribution for the study (Morgan, 2008). Occasionally participants' acquaintances were selected, when the participants suggested interviewees from other stakeholder groups. This was done in order to avoid biases, such as interviewing people from the same cluster. Also, given the nature of the policy under scrutiny — the *2009 Reef Plan*, which was a public and formal policy — a snowball process was not essential to locate potential participants: unlike case studies that involve criminal or clandestine activities, where participants are difficult to identify and locate.

Briefly, the selection of interviewees relied on a key informant from the state government with direct experience in implementing the *2009 Reef Plan*. This key informant provided the researcher with general knowledge of the policy, complementing the information obtained from the document review. The informant also provided the first initial contacts for the interviews. Then, the researcher selected the people most appropriate to respond based on two criteria: 1) direct experience in implementing the *2009 Reef Plan*, preferably involved during the five years of the program; or 2) indirect experience, but with enough knowledge based on their position and role. The purposive sampling was done by contacting directly the organisations involved (e.g. governments, NRM bodies or agricultural representative organisations) and asking to locate the person who met the criteria mentioned above.

The emphasis was on inviting participants with experience and knowledge with the water quality plan, leaving aside other considerations, such as gender inclusion. Then, snowball was followed when these participants suggested contacts from other

stakeholder groups. Given the time-frame of the program (focused on events from 2008 to 2013) and its specialised scope (knowledge on governance matters), few people met the criteria. In the end, there were 22 participants (excluding the key informant) from managerial and executive positions. The interviews were done face-to-face and by telephone, in the cases where the participants were not available to meet in person. Each interview lasted about one hour. The open-ended questions were based on the document review as well as the Process-Outcome governance framework (See Appendix C for more detail). Interviews were recorded and transcribed in English by the researcher using an online transcribing tool. The interviews followed a semi-structured format in order to allow more in-depth responses from the participants. Table 3.2 below shows the distribution of participants interviewed by sector and gender.

Table 3.2 Research participants by sector and gender.

Research participants	Federal gov't	State gov't	Regional NRM bodies	Agriculture industry	Conservation	Academic	Total
Male	1	3	7	3	1	1	16
Female			5	1			6

Interviews represented the fieldwork of this study. In some cases, the researcher travelled to the NRM regions to interview participants from the NRM bodies, while in other cases the interviews were done by telephone using facilities at the University of Queensland. Finally, the interviews followed the ethical protocol of the University of Queensland for research involving human participants. For each participant, the researcher sent an email that included a participation sheet (see Appendix D for more details) that explained the research project and the interview, and the list of questions along with the evaluation instrument. Then, a meeting was agreed to be either face-to-face or by telephone.

Evaluation instrument

The evaluation instrument represented the first quantitative method of data collection. This instrument was based on the collaborative governance processes criteria from the Process-Outcome governance evaluation framework. The researcher developed a series of statements based on this governance processes criteria, which were designed to be ranked by the 22 participants based on a five-ranking scale of Strongly Disagree; Disagree; Neutral; Agree; and Strongly Agree. (See Appendix E for more detail.) The

instrument was designed to rank the governance processes and identify how they contributed in the achievement of environmental outcomes. This quantitative method of collecting data was based on the perceptions of the participants. Apart from the ranking and identification of processes, the evaluation instrument would also allow finding points of convergence and divergence among the different stakeholder groups. The participants were also asked to provide details on their answers, which were considered for the case study analysis. The evaluation instrument was designed to evaluate in more detail the collaborative governance processes in their relation with the environmental outcomes achieved.

Water quality data

From 2008 to 2013, the federal and state governments had in place a reporting program to inform about the implementation progress of the *2009 Reef Plan*. This was called the Paddock to Reef program and it provided information about the achievements on water quality outcomes through annual Report Cards. The water quality outcomes reported were based on a modelling program that built on the water quality data provided by each NRM region. The water quality outcomes represented estimates of the water quality outcomes, not actual results. However, this information was useful to obtain an approximate picture of the impact of the water quality plan. For this study, this was a second quantitative method of data collection. The information on the Report Cards was used to understand the results achieved by the *2009 Reef Plan* overall and also at the regional level.

To provide context to the water quality outcomes of the *2009 Reef Plan*, information was collected on the context of the NRM regions (e.g. socioeconomic characteristics and water quality impacts) to understand the nature of the water quality program in each region. Information was also collected regarding the governance structures of the NRM bodies to gain understanding, and develop explanations, about the impact of their collaborative approaches on water quality outcomes. This information underpinned basic statistical analysis to examine the relationship between collaborative governance and water quality outcomes. Amongst the data collected, information was gathered on the existence and number of coordinator positions. Coordinators were a specific collaborative role appointed by the NRM bodies: the coordinator (or sometimes called an extension officer) had the role of engaging with the landholders (e.g. farmers) to promote changes in land management practices. This information was obtained by

contacting (by email or phone) the participants of the NRM bodies, who specified the number of coordinators and their role in their regions.

3.3.5 Data analysis

The data analysis combined limited quantitative and more extensive qualitative methods. Quantitative methods, such as basic statistical analysis, were used to answer the second and part of the third research sub-questions of Objective 2 (discussed in Section 3.3 Research Design). Qualitative methods, such as literature and document reviews or coding, were used to answer the sub-question in Objective 1; the first sub-question of Objective 2; and complement the answer to Sub-question 3. Qualitative analysis was also used to answer the sub-question of Objective 3.

Overall, both qualitative and quantitative analysis contributed in answering the primary research question of this study: *how has collaborative governance impacted on environmental outcomes in Australian natural resource planning and management?* The different data collection methods used in this study, such as interviews, water quality data, evaluation instrument and document review, represented a triangulation strategy, recommended by Yin (2014) to corroborate information and provide robust evidence to the research question's findings.

It is important to note that, for this study, there are two aspects to the unit of analysis (i.e. organisation or agency according to Yin, 2014). First, the *2009 Reef Plan* and the organisations and government agencies of the stakeholders involved in the plan. The second unit is represented by the regional NRM bodies, who were the central actors in the implementation of the plan. The analysis first considered the role of collaboration; then it 'zoomed in' to the regional level, focusing on the different impacts of the NRM regions' collaborative approaches and context. Later the focus 'zoomed out' again to consider the first unit of analysis and examine the overall impact of collaboration on the environmental outcomes of the case study. This meant that the single case study of the GBR had embedded six sub case studies represented by the six NRM regions of the GBR. Figure 3.1 shows the phases of the research methodology. Figure 3.3 shows in more detail the three stages followed in the analysis based on the objectives of the research design and also illustrates how the stages complemented each other to validate the data.
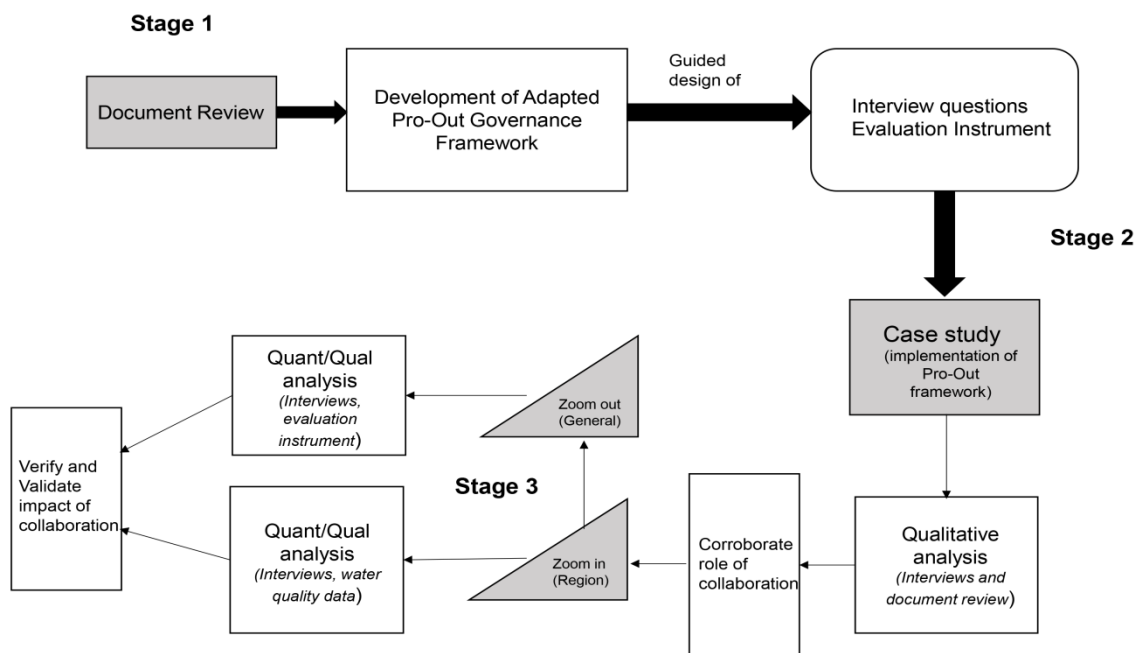
Figure 3.3 Data gathering process and analysis.

Stage 1 undertook a literature review that provided the basis from which to adapt the Process-Outcome governance evaluation framework selected for the study. The framework also served as the basis for the development of the evaluation instrument and interview questions. These questions were also based on document review about the implementation and results of the *2009 Reef Plan*.

Stage 2 involved the application of the adapted framework to the GBR case study. First, interviews and document review served to corroborate the role of collaboration. This led the analysis to a 'zoom in' into the regional level at Stage 3, in which the impact of collaboration on water quality outcomes was analysed through water quality data and interviews. In this 'zoom in', the quantitative analysis undertook basic statistical analysis using visual tools (e.g. charts and pies) to visually compare values across a few categories. This analysis was complemented by interviews with the participants from the NRM bodies.

For Stage 3, the analysis adopted a 'zoom out' phase, and the analysis included the federal and state levels and the participants from those levels. The quantitative analysis in this phase focused on the results provided by the evaluation instrument. It relied on visual tools to compare values across few categories as well as simple correlations. The analysis was also complemented by analysis of interviews. The two parts of Stage 3 ('zoom in' and 'zoom out') contributed to verify and validate the impact of collaboration.

The findings obtained through these three stages provided the basis to address the fourth research question contained in Objective 3 of the research design. They also enabled implications to be inferred and recommendations to be developed as a result of this study.

3.4 Conclusion

In this chapter, I presented the research methodology followed by the study. First, the research perspective (ontological and epistemological approach) was offered, which combined a pragmatist and post-positivist stance. Then, the research design was discussed, including the three objectives that guided the research. Case study, the main research strategy, was also explained, along with the mixed methods research approach and the adapted governance framework that guided the study. Finally, the data collection and data analysis processes were described and explained. Overall, the research methodology, and its elements, involve a complexity that is required by the complex research problem being investigated. As previously mentioned, environmental problems are complex and, in consequence, researching them is also a complex task. The next section presents the results of the first objective of this study (Stage 1), and focuses on the collaborative governance processes criteria developed.

CHAPTER 4: IMPACT OF COLLABORATIVE GOVERNANCE ON ENVIRONMENTAL OUTCOMES: A REVIEW FROM ENVIRONMENTAL POLICY AND PLANNING PERSPECTIVES

4.1 Introduction

Collaborative forms of governance have been widely adopted in planning for the management of natural resources, mainly water, land, forests and biodiversity. However, it is unclear what impact this has had in improving the condition of these resources. There is increasing interest in examining approaches of natural resource planning in order to identify how, and if, they have contributed to improving resource conditions. Moreover, the degradation of natural resources is a lingering issue that has been aggravated in recent years by the pressures imposed from development policies as well as climate change.

Collaborative approaches were offered as an alternative due to the unsuccessful attempts of centralised forms of governance at coping with the complexity of environmental issues (Wondolleck and Yaffee, 2000), which involve multiple stakeholders and government levels. Thus, governments began a process of decentralisation, where planning responsibilities were devolved to local and private actors. The main purpose was to reverse the environmental degradation while improving the health of the environment. Collaboration is a type of governance arrangement within planning in which public and private actors engage in collective decision-making processes to develop and implement policies or programs (Ansell and Gash, 2008).

In a pragmatic sense, collaboration is designed as an instrument for solving conflict and promoting cooperation between public agencies, interest groups and citizens (Ansell, 2012). Actors develop partnerships for problem-solving, and emphasise consensus-building on goals and actions (Margerum, 2008). Within the planning discipline, the different forms of planning are viewed as governance activities (Healy, 2003). Hence, collaboration is a type of governance arrangement through which forms of planning occur, such as resource management or environmental planning.

Once collaborative programs were implemented, studies began to investigate questions such as "does collaboration improve natural resource management (NRM)?" (Scott, 2015); "Is collaboration living up to its expectations?" (Conley and Moote, 2003); "What

makes partnerships work?" (Leach and Pelkey, 2001); and "are collaborations more effective in managing resources than centralised approaches?" (Koontz and Newig, 2014). Different forms of evaluation were adopted to assess the actual impact of collaborative governance. Most of them focused on analysing how this approach was operating by examining the planning processes (Koontz and Thomas, 2006) such as degrees of stakeholder engagement or participation (Brody, 2003); levels of trust and consensus (Bulkeley and Mol, 2003; Stern and Coleman, 2015); legitimacy and transparency of planning decisions (Wittmer et al., 2006; and Wallington et al., 2007); or comparisons between processes (Weible and Sabatier, 2009). Others have evaluated the quality of outputs such as plans or projects obtained through collaboration (Berke, 1994; Berke et al., 1997; Berke et al., 1999; McDonald et al., 2004; and Stevens, 2013). These studies contributed to identifying strengths and weaknesses of collaborations in plan development and decision-making processes. Nonetheless, the essential question about whether collaboration led to a healthier environment remained unanswered.

As a consequence, more recent studies have focussed on the results obtained by planning interventions by examining the implementation process. For this reason, they have shifted the attention from processes to outcomes, such as the environmental or social conditions achieved. These studies — examined in this review— assume that assessing the results is the most appropriate method to determine if collaborations are actually effective. The study of environmental outcomes however, remains marginal in the environmental planning field (Koontz and Thomas, 2006).

The aim of this review is to present the results obtained from international research regarding the impact of collaborative governance upon environmental outcomes (e.g. the condition of a natural resource after the planning intervention). It also presents the methodologies adopted and the barriers encountered by researchers in their attempt to evaluate collaborations. The question that guided this review was:

> Based on the environmental outcomes achieved, have collaborative forms of governance improved the condition of natural resources?

This review highlights the lack of any comprehensive research about environmental outcomes in collaborative environmental planning efforts. Nonetheless, the findings allowed identifying a set of criteria that could be used as an evaluation framework for

further cases that have adopted this governance approach.

This review shows that collaborations have mixed impacts — sometimes positive and sometimes negative — in improving natural resource conditions. Hence, it is not possible to conclude if collaboration leads to better or worse environmental outcomes. The majority of them, however, are able to identify elements of collaborative governance that had an impact when pursuing resource goals, such as stakeholder engagement, public participation, coordination or learning. As a consequence, the review found that collaborations are not the only thing contributing to achievement of results. Other variables, such as context, organisational culture, funding levels and politics need to be taken into account when analysing evaluation results. However, the literature reviewed did not consider these variables in their evaluation frameworks.

In the remainder of this chapter, I provide definitions of some key terms used in this review, such as governance and outcomes. Then, I present the methodology used to conduct the review, followed by the results of the evaluations of collaborative governance. These evaluations are divided into three categories — positive, negative or neutral — based on their impact on environmental conditions. The final section of this chapter contains a discussion of the results, conclusions and suggestions for further areas of research.

4.1.1 Definitions

Outcomes and environmental outcomes. Outcomes are defined by Christensen (2015) as the results of the planning process once it has been completed and implemented. The same author adds that outcome-oriented approaches have been less explored than process-oriented ones (e.g. following a series of rational steps) in the planning literature. One of the main reasons for this lack of outcome-focused analysis is that evaluating the impact of a governance intervention (through a plan or policy) based on the outcomes produced is more complicated. The outcomes are affected by many variables, apart from the governance intervention, such as context, time-frames or data availability. Moreover, there are no linear or simple cause-effect relationships between governance interventions and outcomes (Ferraro, 2009). Hence, evaluations of governance that focus on outcomes are scarce in the literature. The type of results considered in this review are *environmental outcomes*, which refer to the condition or state of natural resources after the collaborative natural resource planning intervention,

such as water quality, soil erosion or biodiversity (Thomas and Koontz, 2011). Outcomes are classified between immediate, intermediate and ultimate (Mickwitz, 2003). The environmental outcomes included in this review refer to the intermediate impacts of planning interventions, which usually relate to the achievement of natural resource targets developed by a program. In this case, the environmental outcomes analysed focused on improvements in water quality or land erosion, without considering the ultimate impact of these improvements on the geographical areas managed.

Apart from environmental outcomes, the resulting social conditions are often considered within environmental planning initiatives. Social capital, trust or increased life quality are examples of social outcomes, and usually they are considered in conjunction with environmental outcomes as the two main results that environmental planning produces. However, Mandarano (2008) argues that environmental outcomes are the product of social outcomes, which in turn, are the product of collaboration outputs or processes, such as plans or inclusion of stakeholders. For example, social capital that results from plan development would result in improved water quality. Whatever the relationship between environmental and social outcomes — as either separate results from the planning effort or linked through a cause-effect relation — most of the studies reviewed consider these outcomes as dependent variables produced by collaborative natural resource planning efforts. Moreover, they are used as key criteria (Conley and Moote, 2003) for evaluating the impact of collaborative governance arrangements in a specific social ecological system. In this review, environmental outcomes are viewed as the key dependent variable in the evaluation of collaborative approaches. By focusing on outcomes rather than processes to evaluate collaboration, is expected to reduce the uncertainty that characterises environmental problems.

Governance. Most of the studies in this review see governance as the collaborative institutional arrangements behind environmental planning or policy efforts to solve a given issue. I considered those studies that evaluated formal collaboration approaches between state and non-state actors in the implementation of plans or policies. I was guided in my analysis by Ansell and Gash's (2008) definition of collaborative governance. Collaborative governance arrangements though, are not created without a link to hierarchical or 'top-down' governance arrangements in the development and implementation of plans or programs. Usually, hierarchical arrangements control the funds and planning priorities. Governance is not a synonym of government, but rather

an activity where different actors (e.g. governments, business, NGOs or communities) arrange a set of social affairs. In this case, the environmental matters that are arranged by natural resource management or environmental planning (Paavola, 2007). Hence, in practice, environmental planning becomes an exercise of environmental governance. Nevertheless, it is worth noting that planning and political science — the main disciplines behind this review — do not have a consensual approach to governance, which even though it has been widely explored, remains open to many definitions. From the political science view, governance is about steering and coordinating decisions and actions (Rhodes, 1997; and Bevir, 2009). For planning, governance is an activity inherent in the act of planning (Healy, 2003), which also steers the processes in order to achieve an expected outcome or goal. See Figure 4.1 for a graphic representation.
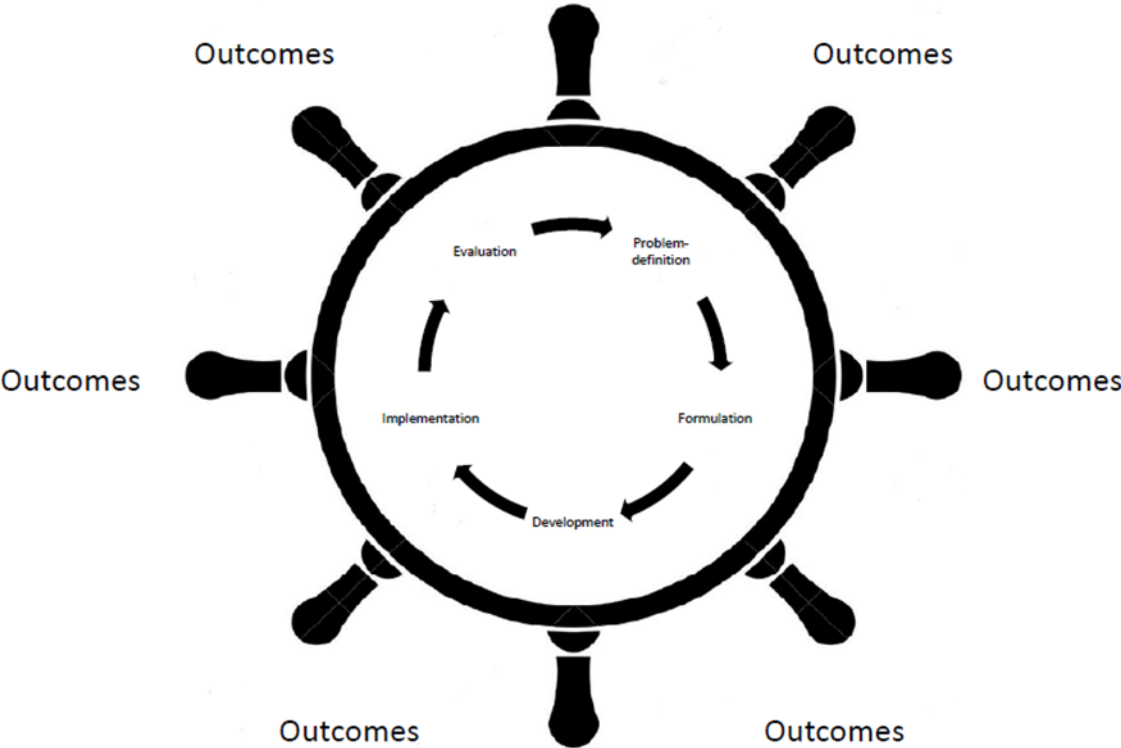
Figure 4.1 Outcome-oriented view of natural resource governance.

Natural resource planning is represented by the planning cycle within the steering wheel, which represents governance. The directions of the 'governance wheel' guide to (but not produce) different social and environmental outcomes.

The focus of this review is on environmental outcomes and the impact that governance has upon them; therefore, the majority of the studies, implicitly or explicitly, view the role of governance as delivering public goods or services. Rotberg (2014), for instance, defines governance as the performance of governments (and other actors) in the

delivery of political goods, following the sum of needs, desires and expectations of citizens. He argues that given this definition, governance should be measured by its results. In other words, by the services it delivers. In this sense, governance becomes something tangible and visible, rather than a vague abstract conceptualisation. Consequently, the evaluation of governance and its impact upon outcomes adopts a performance-oriented view of governance, which has the benefit of allowing its measurement through the quality of public service delivered (e.g. environmental outcomes).

Natural resource planning and management. There is no definition for natural resource planning. The term has been marginally explored in the literature and, in many instances, is not used explicitly. Lachapelle et al. (2003), and Lachapelle and McCool (2005) are the only authors that refer directly to natural resource planning; though, they do not provide a definition. Natural resource planning is primarily a term used in Australia and is often employed as a synonym of NRM. The latter is also a term with no clear definition in the literature. Government and other organisations refer to NRM as the sustainable management of natural resources, such as land, water or biodiversity. It links landscapes and people, who are responsible for sustaining the needs and values of communities within the biophysical limits of natural systems (NSW Government, 2012).

However, NRM should not be confused with natural resource planning, which is linked closely with environmental planning. Environmental planning is another term without clear definitions in the literature; however, it refers to the decision-making processes underlying land development that seeks to achieve sustainable outcomes through the consideration of environmental, social, political and economic factors (Conacher and Conacher, 2000). It is about managing and protecting environments that are modified by human activities (Byrne et al., 2014). In this sense, natural resource planning is an activity of environmental planning that deals with the decision-making processes involved with the management of natural resources. Conceptually, natural resource planning facilitates and plans NRM initiatives (NRM, in this case, is contained within planning). Furthermore, planning for natural resources occurs through a set of institutional arrangements involving a number of rules, actors and norms which enable its operation. These arrangements are commonly referred to as the main elements that comprise governance. Summarising, natural resource planning sets the frame of NRM

activities through decision-making processes, while governing them through a set of institutional arrangements as shown in Figure 4.2.
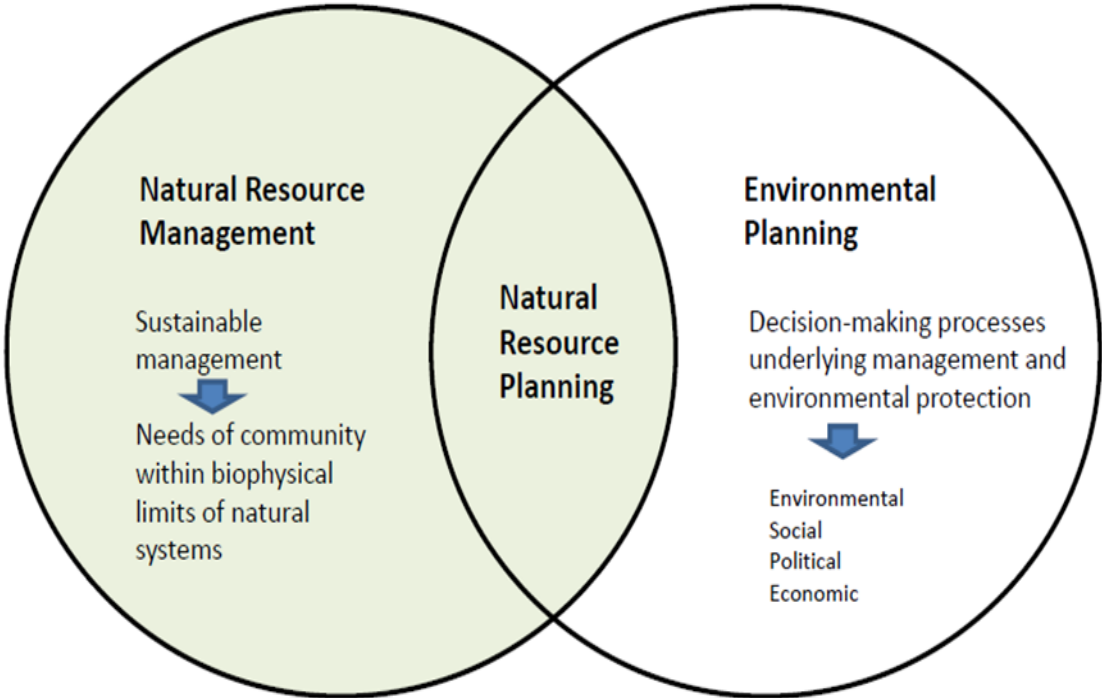
Figure 4.2 Relationship between NRM, natural resource planning and environmental planning.

4.2 Methods

The review was based on a search of publications related to the impact of governance upon outcomes, from an environmental planning or policy perspective. A keyword search was made from July 2014 to November 2015 for journal articles on the impact of collaboration on environmental outcomes. I prioritised articles published on the second half of the 2000s decade; however, due to the fact that little research has been done on this topic, any date before the period mentioned above was considered, as long as it related to the topic.

Three major databases were used for the search: Google Scholar, ScienceDirect and ISI Web of Science. The search was done using 30 keyword combinations, including collaborative governance or collaboration, natural resources, planning, environmental outcomes, implementation, results and evaluation as key terms. More than 100 articles were found in the first phase. Additional searches did not uncover further relevant

articles. After two iterations for refining the selection were done by examining the abstracts and introduction sections, 36 publications were selected for this review. These publications include mostly peer-reviewed articles from planning and political science, but also, in some cases, from environmental management and related disciplines. The selection was complemented by book chapters that addressed the review's research question. Conferences papers and theses were not included, for manageability and focus, as argued by Leach and Pelkey (2001). It is worth noting that very few papers studied the impact of governance upon the condition of a given natural resource (an example of a result that makes governance something tangible).

For this reason, the selection offered by the review includes publications that proposed forms of evaluating collaborative approaches within environmental planning, or that offered insights on the limits and opportunities of collaboration in natural resource planning. According to percentages, 46% of the publications related directly with examining the impact of collaboration upon a given natural resource; 29% presented evaluation approaches to assess collaborative NRM initiatives, without testing them on the condition of a given natural resource (most of them focused on assessing planning implementation, suggesting improved outcomes); and 25% provide insights on the limits and opportunities of the collaborative approach in natural resource governance.

The majority of the research contained in these 36 publications was undertaken in developed countries, mainly Australia, Germany, United Kingdom (UK) and the United States (US). Only two were from the developing world, both in Africa. Microsoft Excel was used to classify the findings, methods and limits identified by each of the 36 studies. The next section presents this content, which highlights the fact that little research has been devoted to governance and outcomes in natural resource planning.

4.3 Results

4.3.1 Collaborative governance and environmental outcomes: a mixed-impact

The results presented in this section focus on those studies that examined the impact of collaborative governance upon a specific environmental outcome. However, only three evaluated the impact of collaborative governance as a whole on environmental outcomes. All of the others analysed particular elements within collaborations. For instance, how the levels of stakeholder engagement or coordination impacted upon

environmental conditions; or how regulations and public participation affected natural resource conditions. The studies considered addressed the difficulty of undertaking outcome-oriented evaluations by taking into account the long time lag between the intervention and the resulting environmental outcomes. The studies also relied on regression or multiple case-studies to add robustness to their findings (see Table 4.1). However, in their analysis they omitted the consideration of contextual factors such as geographic or socio-economic conditions that could have influenced the resulting outcomes.

Table 4.1 Studies related to the effect of collaborative governance on environmental outcomes.

Author(s)	Year	Quantitative method	Qualitative method	Country
Ananda and Proctor	2013		Case study	Australia
Berke et al.	2006	Permits review	Case study	New Zealand
Biddle and Koontz	2014	Regression	Case study	US
Carter et al.	2015	Regression		US
Daley	2007	Treatment effects regression		US
Kim J.H., et al.	2015	Regression		US
Koontz and Newig	2014		Case study	Germany and US
Laurian et al.	2010		Case study	New Zealand
Mandarano	2008		Case study	US
Meyer and Konisky	2007	Regression		US
Mitchell et al.	2016		Scenario planning	Australia
Mohammed and Inoue	2014		Case study	Africa
Muñoz-Erickson et al.	2010		Case study	US
Newig and Fritsch	2009	Regression	Case study	US and Europe
Rogers and Weber	2010		Case study	US
Scott	2015	Linear regression modeling		US
Wild River	2006		Case study	Australia

As shown in Table 4.2, the results were classified according to a positive, negative or neutral impact of collaborative governance upon natural resources. Additionally, they were categorised following the main independent variables assessed by the studies — either the collaboration itself or the elements that compose this form of governance and the methodologies used in the analysis. Overall, the section shows mixed results between the impacts of collaborations, with a clear tendency towards a positive effect.

With regards to the *collaborations* category, Biddle and Koontz (2014) and Scott (2015) found a positive impact in improving water quality. Biddle and Koontz (2014) highlight the strong correlation between following clear goals through collaboration and pollution reductions; while Scott (2015) concluded that collaboration improved water quality

(without recognising how), but more importantly, collaborating did not worsen the quality of the resource examined. Scott's (2015) findings contradict those of Biddle and Koontz (2014) by stating that groups with specific goals perform worse than those who lack them. On the other hand, Muñoz-Erickson et al. (2010) were neutral about the impact, as they did not find strong evidence suggesting that collaborative efforts (compared to hierarchical ones) led to better ecological outcomes. It was also unclear in their study if collaborative decisions were implemented.

In the *stakeholder engagement* category, Carter et al. (2015) found that collaborating was key to implementing effective land conservation. They added that having clear targets and goals has a positive effect as it helps organisations to know what they want to achieve. This supports the main argument of Biddle and Koontz (2014). In contrast, Scott (2015) found that stakeholder involvement made no difference in planning implementation for water resources. Stakeholder engagement is related to the input of key state and non-state actors in the decision-making and implementation processes within natural resource planning. Collaboration, usually through the form of partnerships, is required in the engagement strategies.

Another positive impact was found in the *coordination* category, which refers to the levels of coordination between the actors involved in planning implementation (for a further discussion of this governance concept see Morrison et al., 2004).

Three studies argued that high levels of coordination between stakeholders contributed to successful NRM. Koontz and Newig (2014) highlighted the role of networks in coordinating effective implementation of watershed management; while Rogers and Weber (2010) viewed coordination as key in promoting information exchange, which contributed to effective management of forests and watersheds. This is also supported by the findings of Kim, J. H., et al. (2015), who showed that low coordination (understood as high degrees of fragmentation between institutions) impacted negatively upon water quality, as it led to more pollution of the resource.

Table 4.2 Impact of collaborative governance on environmental outcomes.

Category	Positive impact	Negative impact	Neutral impact	Natural resource examined
Collaborations	Biddle and Koontz (2014); and Scott (2015)		Muñoz-Erickson et al. (2010)	Water
Stakeholder engagement	Carter et al. (2015)		Scott (2015)	Water and land
Coordination	Koontz and Newig (2014); Kim J.H., et al. (2015); and Rogers and Weber (2010)			Water
Regulations	Berke et al. (2006); Laurian et al. (2010); and Mitchell et al. (2016)	Ananda and Proctor (2013)	Koontz and Newig (2014)	Water, land and biodiversity
Subsidiarity /Decentralisation	Wild River (2006)	Mohammed and Inoue (2014)	Meyer and Konisky (2007); and Newig and Fritsch (2009)	Forest and water
Participation	Daley (2007); Newig and Fritsch (2009); and Biddle and Koontz (2014)			Waste and water
Learning	Mandarano (2008)			Biodiversity

With regards to *regulations*, which relate with governments' enforcement through control or sanctions, four analyses (Berke et al., 2006; Laurian et al., 2010; Mitchell et al., 2016) stated that they were a positive factor in enhancing the condition of the natural resources examined. Including regulations as an element of collaboration is a recognition that collaborative governance arrangements do not include only collaborative mechanisms. Within natural resource planning, collaboration is usually supported by hierarchical or vertical arrangements established by the government. This reflects the hybrid nature of governance experiments that are common in the environmental planning area, as identified by Lemos and Agrawal (2006). In addition, this suggests that relying on sanctions, rather than voluntary compliance, is not necessarily ineffective or counterproductive, as it could be perceived in collaborative natural resource planning.

On the other hand, regulations underline a tension between official promotion of collaboration, and the attempts to retain public control of the planning process. Ananda and Proctor (2013), argued that 'top-down' regulations limit the capacity of collaboration, which impacted negatively in watersheds management. Koontz and Newig (2014) remained neutral about regulations as government control had no decisive impact on

watersheds. While their study showed that other elements, such as funds or leadership, were more important in enhancing watersheds' ecological condition.

The tension between collaboration and regulations is reinforced by the findings in the *subsidiarity* category. Subsidiarity involves decentralisation, which occurs by devolving natural resource planning responsibilities to the local level. It is considered to be the most appropriate approach due to its proximity to the environmental issues. In collaborative approaches, local state and non-state actors are given a key role that differs from the secondary part they play in centralised governance. Wild River (2006) suggests that local governments obtain more beneficial environmental outcomes due to their ability to work beyond statutory requirements; however, Mohammed and Inoue (2014) found that devolution of responsibility to local actors did not result in positive outcomes for forests. Moreover, such arrangements generated more forest harvesting due to the discretionary power that decentralisation rendered to local actors. On the other hand, in their comparison between local and higher level institutions, Newig and Fritsch (2009) and Meyer and Konisky (2007) indicate a neutral impact as they had no strong evidence to sustain that local collaborative institutions achieved better ecological conditions for wetlands than state or federal ones. Hence, these results show the contradictory impacts between regulations and devolving authority through subsidiarity.

Finally, two other elements, *participation* and *learning*, were identified to have a positive impact upon environmental outcomes. Participation refers to citizen input in implementing environmental planning initiatives. In this case, Daley (2007) showed that participation through organised community groups improved the environmental health of hazardous waste sites in rural and urban areas. In addition, Biddle and Koontz (2014) argued that sustained participation was essential for setting specific goals, which in turn contributed to improve water quality. Finally, Newig and Fritsch (2009) found that participation of non-state actors led to improved implementation of water quality standards. In their view, participation increases the legitimacy of public decisions, which is a "major precondition for compliance and a swifter implementation" (p. 206). With regards to learning, which deals with information sharing (e.g. best practices in habitat management) among the actors involved, Mandarano (2008) concluded that learning between stakeholders led to improved habitat protection and restoration. In line with his argument that social outcomes produce environmental ones, he considered that learning generated better habitat conservation.

In summary, the results of these studies show that collaborative governance has a varied impact on environmental outcomes, which do not allow absolute conclusions. However, they suggest that collaborating is positive as the majority of the studies reviewed identified a positive impact from each of the elements enlisted within collaborative governance. In addition, despite the different contexts involved in each study, similar governance elements were shared by the planning collaborations examined (e.g. stakeholder engagement, public participation, coordination, learning or the principle of subsidiarity). This implies that collaborative governance was evaluated following the elements shared, but generated different results according to the context; hence, it is not 'a-one-size-fits-all' model.

4.3.2 Evaluation approaches

This section presents the approaches used to evaluate collaborative governance within environmental planning. It is framed by prior reviews — offered by Conley and Moote (2003), and Thomas and Koontz (2011) — about the approaches and methods for evaluating collaborative natural resource planning initiatives. In contrast with the previous section, and as Table 4.3 shows, these studies do not focus on assessing the impact of collaborations upon a specific natural resource, but rather they present research designs to examine them. Evaluation criteria, according to Conley and Moote (2003), are commonly divided between processes or environmental and social-economic outcomes.

In this case, the reviewed approaches stand as proposals that cover both processes and outcomes; however, they did not test degrees of achievement of environmental outcomes. On the contrary, they were used to: 1) present proposals of how to evaluate the implementation process (the previous step behind the production of outcomes); 2) actual assessments of this process; or 3) provide a set of criteria to evaluate NRM initiatives. The main thing to highlight is their diversity. While all of them included elements of governance within their frameworks, they differ in their logic and purpose. They were also designed for a specific context (e.g. country or area examined) even though they were presented as general frameworks that can be translated to international contexts. Most of the frameworks were developed and applied to specific case studies, while others focused on reviewing research designs in the evaluation of collaborations. The frameworks' classification was based on Conley and Moote (2003)

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and Thomas and Koontz (2011) categories of approaches and their methods used when evaluating collaborative NRM initiatives.

The majority of the approaches reviewed were used to evaluate the implementation process within environmental planning policies. Based on the governance definition I provided in the Introduction of this chapter, implementation is the key governance activity that delivers the public services — the tangible outcomes. The analysis of implementation (either in plans or policies) has been marginal in environmental studies (Newig and Koontz, 2014). By assessing this process, some of the literature provides suggestions for improving outcomes.

Table 4.3 Evaluation approaches and methodologies.

Author (s)	Year	Type of Evaluation (Conley and Moote, 2003)	Criteria (Conley and Moote, 2003)	Evaluation methods (Conley and Moote, and Thomas and Koontz, 2011)	Venue
Bellamy et al.	2001	Comparison*	Process	Case study/Qualitative	Australia
Chapman	2014	Goal directed**	Environmental and socio-economic outcomes	Case study/Qualitative	Africa
Emerson et al.	2012	Goal directed	Process + Impacts/ Adaptation	Case study/Qualitative	US
Faehnle and Tyrvainen	2013	Comparison	Process + environmental and social outcomes	Case study/Qualitative	Finland
Koontz and Newig	2014	Goal directed	Environmental and socio-economic outcomes	Case study/Qualitative	Germany
Laurian et al.[A]	2004	Goal directed	Process + environmental outcomes	Case study/Quantitative	New Zealand
Laurian et al.[B]	2004	Goal directed	Process + environmental outcomes	Case study/Quantitative	New Zealand
Lockwood	2010	Comparison	Process	Case study/Qualitative	Australia
Margerum	2008	Comparison	Process + environmental outcomes	Case study/Qualitative	Australia and US
Newig and Koontz	2014	Goal directed	Process + environmental outcomes	Document analysis/Qualitative	European Union
Vacik et al.	2014	Comparison	Process	Document analysis/Qualitative	European Union

* Refers to comparisons between cases in order to determine best practices.
** Refers to whether and how collaborations meet their objectives or goals.

For instance, Koontz and Newig (2014) rely on the Institutional Analysis Development Framework (IAD) to analyses the impact of collaboration on water planning

implementation. Following the IAD's Framework three levels of analysis, they found that the plans and directives developed at constitutional and collective choice levels had little influence on the actions at the operational level. Implementation is rather discrete and immediate, without consulting plan directions. They suggest that through a better coordination of levels, the implementation process can be improved and, hence, its results. The IAD's Framework levels of analysis are also used to explain multilayer implementation of water policy within multi-level governance systems (Newig and Koontz, 2014). For these authors, the operational level of implementation is usually done at lower levels of government (local or state). In this case, collaborative governance refers to a 'bottom-up' implementation approach, from lower to higher levels of government.

The qualitative evaluation approach of the IAD Framework links with Margerum's (2008) typology of collaborations, which used three levels of analysis to differentiate between implementation approaches: 1) operational or action level ('on-ground' activities); 2) organisational (plan development and implementation); and 3) policy (rules and guidelines). Most of the actual implementation in the typology, again, occurs at the operational level, in which local governments are delegated this responsibility by central authorities. Within this model, the most important evaluation measures are environmental outcomes.

In an attempt to evaluate implementation within a collaborative setting, Laurian et al. (2004a) and Laurian et al. (2004b) developed and tested the Plan Implementation Evaluation (PIE) framework. Its main purpose is to assess quantitatively the degree of conformance between plan objectives and its outcomes. It has two indicators, depth and breadth of implementation. The first estimates the proportion of actions implemented by each plan objective, while the latter calculates the proportion of actions implemented at least once. The PIE framework is comprised by four factors: 1) plan quality; 2) capacity and commitment of planning agency; 3) commitment of target stakeholders (e.g. farmers) and their interactions with the agency; and 4) project scale. The PIE was assessed on local-land use plans.

Emerson et al (2012) developed a diagnostic model for collaborative governance, based on two key elements within collaborative governance regimes: 1) collaborative dynamics; and 2) collaborative actions. Both include a series of governance processes, where the collaborative dynamics lead to collaborative actions that could also refer to

governance outcomes (e.g. securing endorsements, deploying staff or enforcing compliance). Collaborative dynamics and actions lead to impacts, such as social, political, environmental or economic outcomes. These impacts lead to adaptation, which is the ultimate function of collaborative governance regimes. By adapting, the regime improves its operation. Faehnle and Tryvainen (2013) link processes and outcomes in their framework to assess both the quality of the collaboration process, and the outcomes of the socio-ecological system studied. They do not focus, however, on a specific natural resource. Outcomes, in their view, refer generally to an improved quality of the natural environment. The collaborative framework is designed for qualitative assessments. It includes four perspectives: 1) knowledge integration (learning); 2) meaningful involvement of stakeholders (stakeholder engagement); 3) functioning governance (coordination and regulations); and 4) sustainable use of the area (outcomes). These perspectives are a benchmark to qualify the level of effectiveness of the collaboration. Similarly, Chapman (2014) offers a framework that integrates processes and outcomes, emphasising the social benefits that collaborative NRM initiatives should accomplish (e.g. community well-being). It follows a linear sequence between needs, processes — divided between programs and mediating programs — and outcomes. She argues that a mediating program, such as environmental governance capacity, is necessary to achieve environmental outcomes. This argument supports Mandarano's (2008) view of social outcomes, such as learning, either producing or preceding environmental ones.

Lastly, Lockwood (2010) offered an evaluation approach that combines the assessment of governance effectiveness and governance quality. Within his model, outcomes are a measure of effectiveness; however, he focuses mainly on governance outcomes, rather than social or environmental. For this purpose, he developed seven principles of 'good governance' to guide assessments of biodiversity protection. Bellamy et al. (2001), for their part, also developed a set of principles as guidelines for evaluation. Contrary to Lockwood's focus on 'good governance', their emphasis is upon the implementation process. A similar approach was used by Vacik et al. (2014), who offer criteria for assessing implementation based on learning, stakeholder engagement and transparency, emphasising the importance of producing clear results.

The review of these approaches shows that, while they did not directly assess the condition of a natural resource, they stand as theoretical frameworks that serve to guide

the evaluation of implementation: the phase that produces the environmental outcomes. The frameworks and their benchmarks become pathways for the improvement of implementation within collaborations, but it is not possible to conclude that they would necessarily lead to improved environmental outcomes. They leave a gap that was covered, to some extent, by the studies presented in the previous Results section (4.3).

4.3.3 Opportunities and barriers of collaboration

This section extends the previous results by presenting some insights and recommendations from evaluations that were not designed to assess outcomes (either environmental or socio-economic). Nonetheless, they provide suggestions to improve the implementation process towards the achievement of better outcomes. In addition, this section provides the key barriers to the assessment of outcomes through collaborative governance approaches.

Regarding the opportunities, Morrison et al. (2004) argued that integration (viewed, for example, as coordinating the implementation effort between the actors involved) translates into improved environmental outcomes, but it requires institutional change. It is worth noting, as O'Toole (2000) remarked, that implementation has a multi-actor character, in which multiple institutional actors are required to coordinate for successful implementation. Better integration to obtain improved outcomes within the collaboration approach was also supported by Peterson et al. (2010). Another way to view integration is through the effective coordination between the IAD's levels of analysis: operational, collective choice and constitutional. For Paavola (2007), these levels are the essential institutional functions of governance arrangements. In his view, though, institutional rules such as who is entitled to use a resource are what most likely determine environmental outcomes.

Dale et al. (2008), on the other hand, provided a list of improvements that would lead to better natural resource condition outcomes. Apart from governance elements — such as better integration of plans, alignment of implementation efforts or improved program delivery — the authors recommended long-term continuity of funding and commitment. Leach and Pelkey (2001), identified factors of improved effectiveness not directly related to governance categories previously mentioned, such as stakeholder engagement and coordination. Factors highlighted were leadership, funds, trust, limited scope of activities and effective communication between stakeholders. The authors added that

effectiveness was measured by the environmental and social outcomes achieved. Aside from assessing factors that impact upon the condition of natural resources, Christensen (2015) stated that outcome-oriented studies (such as the ones included in this review) are about seeking equitable results and democratic processes.

There are two main barriers in evaluating effectiveness of collaborations: 1) monitoring; and 2) research designs. In the first, Hajkowicz (2009) concluded there needs to be effective monitoring and evaluation of expenditures. Without this, it is impossible to determine the achievement of environmental outcomes as there are no data about progress. Poor monitoring and targeting is an issue shared by most Organization for Cooperation and Economic Development (OECD) countries. In the case of research designs, Koontz and Thomas (2006) argued that innovative methodologies are necessary to demonstrate that collaboration achieves better environmental conditions than non-collaborative processes. However, they did not identify any methodologies different to the ones presented above. Research designs could be improved by complementing the analysis with counterfactual methods (e.g. experimental and quasi-experimental approaches) — as suggested by Ferraro (2009); and Prowse and Snilstveit (2010) — to compare if the same outcomes would have been achieved without the collaborative intervention. Both barriers are difficult to overcome due to the lack of data about environmental outcomes. Moreover, they are interrelated as data are obtained through effective monitoring and stronger research designs can only be developed through improved data availability.

4.4 Discussion

The evaluations reviewed about the impact of collaborative governance upon environmental outcomes show great diversity and a lack of standardised methodologies and evaluation criteria. However, they all revolve around key characteristics of collaborative arrangements and their influence on achieving natural resource conditions. In this review, I considered those common characteristics as governance categories within the collaborative approach. For example, levels of coordination, stakeholder engagement, participation or learning within the implementation of plans or policies had a positive influence. The beneficial impact was complemented by incorporating elements related with hierarchical arrangements, such as regulations and decentralising implementation to local levels (see Table 4.4 for the selection criteria). It

could be inferred that a collaboration that includes all these elements should be effective in achieving environmental outcomes. However, the effectiveness at achieving environmental outcomes depends also on the context in which the collaborative approach is adopted and implemented. There is no 'one-size-fits-all' model. Therefore, this review does not offer a prescribed model of 'good' collaborative governance.

Table 4.4 Evaluation criteria for governance of implementation within a collaborative approach to natural resource planning.

Collaborative governance criteria (no specific measures)	Stakeholder engagement Coordination Participation Learning Regulations Decentralisation
Environmental outcomes (condition of resources before and after the planning intervention)	Water Land Forests Biodiversity

In general, the studies reviewed focused on assessing a specific feature of collaborations such as stakeholder engagement, coordination or participation and its impact upon attaining environmental outcomes. Only three studies evaluated the impact of collaborations as a whole, combining the influence of the different elements that encompass the collaborative approach. A contribution of this review, hence, was to identify and classify a series of elements that comprise the collaborative approach. I suggest that they could be used to inform an evaluation framework. Overall, there has been very limited research done about collaborations and its results. However, as the majority of the analyses were done from 2010 onwards, attention on them is increasing.

The limited research also indicates the difficulty in determining the relationship between collaborative governance and environmental outcomes. Implementation, is the process that directly links them, driving the achievement of outcomes but, as Koontz and Newig (2014) argue, their interrelation requires further exploration. Further research should examine, particularly, cause-effect and more indirect relationships between processes (collaboration) and outcomes (natural resource conditions) within natural resource planning, taking into account contextual factors in their evaluation frameworks.

Regarding the characteristics of the research reviewed, most were done in developed countries, such as the US and Australia. Half of the studies relied on qualitative case-

study analysis, such as interviews or surveys. The other half used quantitative methods of analysis. Overall, our analysis is consistent with the two common methods for evaluating collaborations, measuring tangible outcomes or participants' perceptions (Conley and Moote, 2003). Water was the resource mostly examined; indicating that this may be the issue of highest priority. The two key barriers identified in this review were: 1) data availability, which is partially explained by the lack of monitoring, but also by the long time-frames required to detect changes in environmental conditions; and 2) evaluation methodologies, which in the majority of the cases did not have a clear set of criteria or access to data about natural resource outcomes.

Among the results presented, only six studies relied on numeric data about the ecological condition of the natural resource examined (Biddle and Koontz, 2014; Carter et al. 2015; Daley, 2007; Kim et al., 2015; Meyer and Konisky, 2007; and Scott, 2015). The other quantitative analysis reviewed documents (e.g. plans) to produce their results. Quantitative methods of data collection tend to be more robust as they are more objective measures than actors' perceptions (Rotberg, 2014), particularly when related to environmental conditions. However, due to a widespread lack of quantitative data, most of the studies rely on stakeholder experiences to evaluate the performance of collaborations. Measures based on participants' perceptions dominate the research in this area.

Limitations in the field include the need to develop different research designs, identified by Koontz and Thomas (2006), and also the lack of a shared conceptualisation of collaborative governance and its characteristics. The concept of governance, moreover, does not have a shared definition within the research field. Hence, few studies offered definitions of what they understood about collaboration approaches and their elements. Albert Einstein (cited in Heisenberg, 1971) argued that theories determine what is measured. The problem with governance evaluations is that there is no consistent theory. Hence, measures cannot lead to conclusive results. This may explain why most of the assessments focused only on an aspect of collaborations. This poor conceptualisation is coupled by the difficulty in identifying clear links (e.g. cause-effect relationships) between collaborative governance and the environmental outcomes it produces.

Even though it was found that collaborative governance has a generally positive impact on environmental outcomes, this review did not find any arguments supporting the

importance of one collaborative element (e.g. coordination) over others in achieving environmental outcomes. Hence, there is no hierarchy between the elements that comprise our collaborative governance criteria. It seems, based on some recommendations (Morrison et al., 2004; O'Toole, 2000; and Peterson et al., 2010), that coordination is more decisive than other governance tasks in the implementation process. However, with such insufficient evidence, I cannot conclude that this is the case. The same applies to the other elements. Overall, it is not possible to argue that collaborative governance is always good as, in some studies, it proved to be negative or inconsequential at improving environmental outcomes. While I found that there are more positive than negative influences, more evidence is required before firm conclusions can be drawn.

Comparisons are also required with other governance approaches, such as centralised/hierarchical or networked as well as with absent governance. By contrasting governance approaches it may be possible to identify the key factors behind effective governance or, at least, elucidate if improved environmental outcomes are a cause or effect behind the effectiveness of governance arrangements. An additional research area is to improve the analysis of the links between governance arrangements and their influence upon implementation to find out which conditions of implementation lead to better environmental outcomes. The importance of this research lies in understanding the significance of governance approaches within planning for improving environmental conditions.

4.5 Conclusions

In this review, I focused on the impact that collaborative governance has on achievement of environmental outcomes. For this purpose, I reviewed the literature within the environmental planning and policy fields, which evaluated studies with an outcome-oriented perspective. The question that guided our review was: "Does collaborative governance lead to improved environmental planning of resources, based on the environmental outcomes obtained?" The key finding is that the collaborative approach has a clear beneficial tendency in improving natural resource conditions; however, it also leads to negative or neutral impacts. The review highlighted, in addition, the lack of a shared understanding about how to conceptualise collaborative governance evaluations and their characteristics.

Furthermore, the focus on environmental outcomes of collaborative interventions within natural resource planning is suggested as the key measure to determine their degree of effectiveness. Effectiveness, on the other hand, is an indicator of success; nonetheless, the studies reviewed avoid making judgements about failures or success of the collaborations they evaluated. I also found that assessing the impact of this governance approach on environmental outcomes is challenging due to the lack of objective data about outcomes available and the methodologies used, which usually present results based on perceptions. The challenges imply that any conclusions are provisional. Moreover, they also complicate the purpose of clarifying the links between collaborations and outcomes. In this case, more research is required in order to determine the type of relationship between governance arrangements and environmental outcomes. This task has the added challenge of dealing with no consistent theory yet about governance evaluations.

The main conclusion is that collaborative governance arrangements are a necessary, but not sufficient, condition for improving environmental outcomes. Other variables need to be considered, mainly funding, leadership and the political context. The focus on governance arrangements as the independent variable does not, by itself, offer a complete explanation about the effectiveness at improving environmental conditions. However, the significance of its evaluation lies in providing guidance in policy development about which types of governance arrangements are better suited for dealing with natural resource planning problems. Developing innovative research designs that take into account other contextual variables remains a great challenge.

CHAPTER 5. BACKGROUND TO THE CASE STUDY: A 'RESCUE' POLICY FOR THE GREAT BARRIER REEF

5.1 Introduction

In the previous chapter, I presented the critical review of studies that focused on the impact of collaborative governance on environmental outcomes. The review led to identify and develop a collaborative governance processes criteria which I adapt to the Process-Outcomes governance evaluation framework for analysing the case study. As I indicated in the previous chapter, the collaborative governance processes criteria serves to inform the evaluation framework used to examine the case study. The adapted framework addresses a research gap identified in the review. The other research gap that I address through the case study is to explore the type of relationship between the collaborative approach and environmental outcomes, such as cause-effect or more indirect relationships.

However, before I undertake the case study analysis, it is important to provide background on the GBR, the issue of water quality in this ecosystem and the water quality planning approaches that have been implemented to solve the environmental problem. The purpose of the background section is to provide context to the case study, such as its environmental and socio-economic conditions. In this chapter, I also provide a brief account of the six NRM regions that run along the GBR catchment, from South to North Queensland. It should be noted that part of the case study analysis focuses at the regional scale (Figure 3.3), in which the NRM regions were the main governance arena in which the *2009 Reef Plan* was implemented.

In the following section, I present an overview of the GBR, highlighting its significance for Australia as well as its major issues. Then, I offer a brief history of the water quality planning efforts since 2003, when the water quality issue was first addressed through these policies. The history emphasises the characteristics of the *2009 Reef Plan*, which is the focus of this study, including also an overview of the current efforts. Thirdly, I present a brief profile of the NRM regions, focusing on its agriculture land uses and their role in natural resource governance. Finally, I summarise the main characteristics of the case study in the conclusion.

5.2 An ecosystem at a crossroad

In 2014, the Great Barrier Reef Marine Park Authority (GBRMPA), a federal entity responsible of protecting the health and values of the Reef, developed its second outlook report on the condition of the GBR. In the first line of its Executive Summary, the report judged that the ecosystem was at a crossroad, and highlighted the need to implement management decisions to improve its condition. This section adopts that line as its title, illustrating in the following paragraphs, how the GBR is still at a crossroads despite the decisions and actions adopted to solve its environmental issues. The content of this section is based on the Outlook reports developed by GBRMPA in 2009 and 2014, which provided a comprehensive account of the GBR status in 2009 as well progress that occurred in five years until 2014 to improve that status (GBRMPA, 2009; GBRMPA, 2014),.

The GBR is one of the most important ecosystems of Australia, representing also one of largest and more biodiverse coral reef systems in the world (see Figure 5.1). The GBR is located in the state of Queensland and extends along 2,300 km of coast. Economically, the GBR contributes around A$5.4 billion annually to the Australian economy (Queensland Government, 2009). The Reef became a federal marine protected area in the 1970s through the establishment of the *Great Barrier Reef Marine Park Act 1975* and creation of the GBRMPA, a federal entity responsible of protecting the health and values of the Reef (GBRMPA, 2009). In 1981, the GBR was listed as a World Heritage Area by the UN. It was the first coral reef ecosystem in the world included in the World Heritage List. This distinction showed the international relevance of the ecosystem, representing an outstanding example of natural beauty and biodiversity. However, being considered as a World Heritage Area also placed international pressure on the Australian government regarding its conservation and preservation for future generations. The pressure mounted during the 2000s when the efforts to improve the GBR's condition became part of the federal and Queensland government agendas.

Figure 5.1 The GBR Catchment (GBRMPA, 2014).

The map includes the boundaries of the World Heritage Area and GBRMPA as well as the Region boundary (red line along the coast), where the impacts of water quality are located. The yellow line within the land are indicates the catchment boundary, where the agriculture activities produce land-based runoff.

In 2003, the first water quality protection plan (or Reef Plan) was developed to manage the decline of water quality entering the GBR Catchment (GBRMPA, 2009). Afterwards, other policies were adopted to preserve the Reef from development impacts, such as policies to manage coastal development, fisheries or protect from threatened species. The efforts culminated with the first Outlook Report of GBRMPA, released in 2009 (GBRMPA, 2009). This was also the same year in which the second Reef Plan was established.

Water quality was considered a major issue in the 2009 Outlook Report. The decline of this natural resource that occurred over the 1990s and beginning of 2000s was largely caused by land-based runoff.[3] Runoff was considered one of the three major factors influencing the ecosystem values of the GBR. The others were climate change and coastal development (e.g. mining and urban development). In 2014, direct use was added as the fourth factor (GBRMPA, 2014). Direct use referred to activities with an immediate impact on the GBR ecosystem, such as tourism, shipping and defence activities.

Additional to the four factors, the 2014 Outlook report identified four drivers of change that influenced the factors: 1) economic growth; 2) population growth; 3) technological development; and 4) societal attitudes. Drivers of change were defined as the "underlying causes of change in the environment" (GBRMPA, 2014, p. 152). Surprisingly, governance was not included among these drivers, although it was as part of the 'societal attitudes' driver. For the report, governance arrangements were a reflection of societal attitudes. Figure 5.2 below shows the drivers and factors, in which I added governance, an aspect not considered by the Outlook Report and addressed in this study.
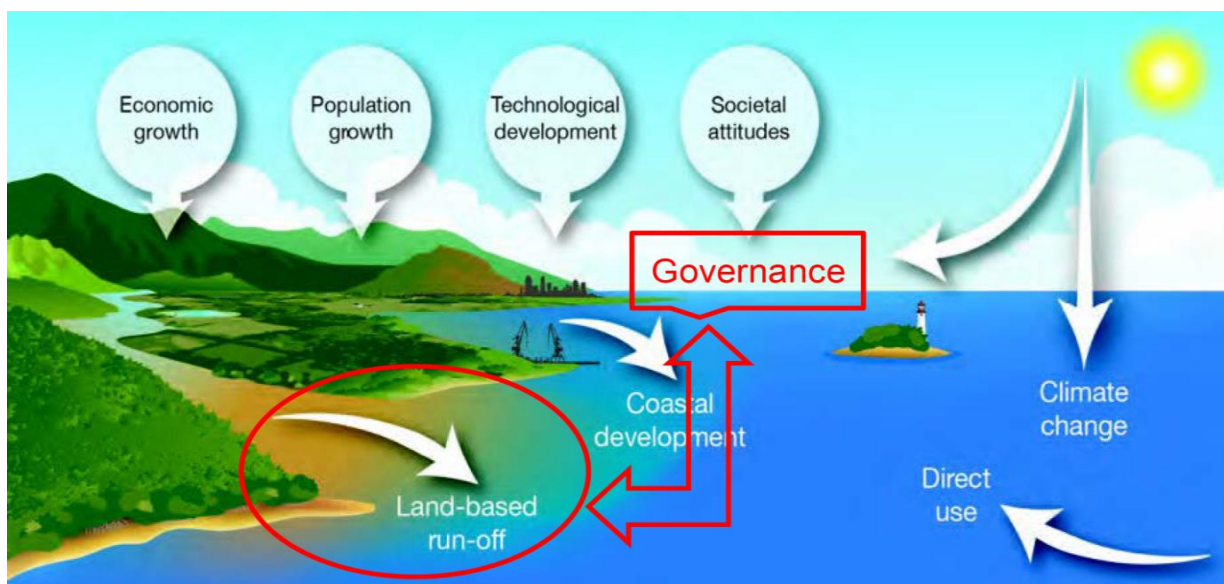
Figure 5.2 Drivers of change and factors impacting the GBR's environmental condition and values, adapted from GBRMPA (2014)

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[3] The 2009 Outlook report referred to this factor as "catchment runoff" (GBRMPA, 2009). When the 2014 Outlook report was released, it shifted the name to "land-based runoff" (GBRMPA, 2014). In both cases, runoff was caused by agriculture.

Land based runoff is the factor of focus in this study as it impacts directly on water quality. Runoff is caused by agriculture activities. Grazing, sugarcane and horticulture represent the main agriculture industries, contributing around A$3.7 billion per year in gross value of production, while supporting significant regional employment (Queensland Government, 2009). These activities occur at the NRM regions of the GBR catchment. Over the years, they have introduced three diffused or non-point sources of pollution to the GBR waters: sediments, nutrients and pesticides. Aside from its impacts on water quality, agriculture represents one of the principal economic activities of the Reef: it, along with mining, is the basis of Queensland's exports. Additionally, it is one of the main economic activities (with construction, tourism and mining) contributing to the economic growth of Queensland. In this regard, the state had an economic growth rate of 4.2% on average from 2004 to 2014 (GBRMPA, 2014).

The 2009 Outlook Report identified pollution from land-based run-off as a major threat and urged for action to improve water quality. This study focuses on the *2009 Reef Plan* introduced to address that demand. Surprisingly, the 2014 Outlook report also noted land-based runoff as a major threat, identifying sediment runoff and nutrient runoff to be 'very high' risk in its assessment of threats (GBRMPA, 2014). Moreover, community groups surveyed, such as residents of GBR catchment or marine tourism operators, recognised agricultural runoff as one of the major threats to the GBR. This meant that the *2009 Reef Plan* did not have a significant impact. Although it recognised the positive results of the *2009 Reef Plan*, along with its management investment, the 2014 Outlook report stated that:

> "Notwithstanding positive actions since 2009, the greatest risks to the Great Barrier Reef have not changed. Climate change, poor water quality from land based runoff, impacts from coastal development, and some remaining impacts of fishing remain the major threats to the future vitality of the Great Barrier Reef." (p. V).

Thus, the actions designed to improve the condition of the GBR, such as water quality planning, have not reversed the trends and issues highlighted by the Outlook Report. As a consequence, the GBR is still at a crossroads. This case study focuses on what occurred in terms of governance of water quality in 2009 that led to similar threatened water quality conditions in 2014. As already described, governance was not considered in the Outlook reports. This case study addresses that gap by focusing on governance of the water quality issue, specifically concerning land-based runoff.

5.3 Water quality in the GBR: the *2009 Reef Plan* and brief history of ten years in governance and planning

The water quality planning efforts to improve the water conditions of the GBR catchment include three water quality plans (2003, 2009 and 2013) and a long-term sustainability plan (2015) to improve the overall condition of the GBR, not only water quality. This long-term plan is based on the findings from the most recent Outlook Report of 2014 (Australian Government, 2015b). These planning efforts were an initiative by the Australian and Queensland governments. This section presents an overview of the *2009 Reef Plan*, including its objectives, goals and governance arrangements. The overview is preceded by a brief account of the 2003 Reef Plan, and followed by the most recent water quality planning efforts in the GBR. Table 5.1 below shows a timeline of the Reef Plans, including their goals, targets and governance approaches.

5.3.1 *2003 Reef Plan*

The first GBR quality plan (*2003 Reef Plan*) had the overall goal of halting and reversing the decline of water quality entering the GBR within the next 10 years (Australian and Queensland Governments, 2003). It represented the first overarching plan involving the federal and state governments to manage the issue of water quality. Agriculture activities were recognised to produce land-based runoff that acted as diffuse sources of pollution. Sugarcane was considered the main agriculture activity in the GBR catchment, generating around A$803 million annually (Australian and Queensland Governments, 2003). This plan, however, did not develop specific targets of water quality to be met in the 10 year time-frame of the plan. The strategy was to reduce the pollutant loads from diffuse pollution, while also rehabilitate areas of the GBR catchment that were able to remove water borne pollutants (Brodie et al., 2012).

Table 5.1 Timeline of the Reef plans developed to manage the water quality issue.

Plan	Time period	Goal	Targets	Governance approach
2003 Reef Plan	2003-2009	Halt and reverse decline of water quality entering the GBR in the next 10 years.	No specific targets for water pollutant reductions were developed.	Collaborative - emphasised by a series of fragmented partnerships
2009 Reef Plan	2009-2013	Halt and reverse the decline in water quality entering the Reef by 2013	Five year targets were developed for nitrogen, sediments and pesticide reductions	Collaborative - underpinned by an overall federal-state collaborative framework that included the Reef Rescue program
2013 Reef Plan	2013-2018	Ensure that by 2020 the quality of water entering the GBR has no detrimental effect on the health of the ecosystem	Five year revised targets (2013-2018) for nitrogen, sediments and pesticide reductions	Collaborative – modified federal-state collaborative framework (no inclusion of another Reef Rescue program)
2050 Reef Plan (draft)	2017-2022	Still in draft.	No targets yet developed	Still in draft.

In terms of governance, the plan did not develop an overall collaborative strategy, although it began to adopt this approach through a series of partnerships to support its implementation. The key stakeholders were identified in this first planning effort, and included federal and state government agencies, agriculture industry groups, landholders, local governments, community groups, regional NRM bodies and indigenous groups (Australian and Queensland Governments, 2003). The regional NRM bodies were considered the "most critical partnerships" (Australian and Queensland Governments, 2003, p. 24), which laid the work for the collaborative approach adopted in the next water quality plan. However, the partnerships (according to the governance design of the plan) were only a single component of the strategy to govern the

implementation. Other strategies included self-management approaches; education and extension; regional NRM plans; and regulatory frameworks. In particular, the regional NRM plans were seen as key for the implementation of the plan. Therefore, each regional NRM body would develop a plan to manage water quality in its region.

Governance strategies for the implementation of the plan presented a fragmented approach. This was recognised by the 2005 progress report on plan implementation (Australian and Queensland Governments, 2005). The report recommended developing more effective partnerships between key stakeholders to improve the delivery of the plan (Australian Government, 2015b). Before reaching its 10 year time-frame, the plan was revised and updated in 2009 to include better targets and actions (Brodie et al., 2012). The next sub-section describes the *2009 Reef Plan*, the focus of this study, to undertake the governance evaluation.

5.3.2 *2009 Reef Plan* and *Reef Rescue*

Updating the *2003 Reef Plan* was agreed in 2008 in a summit between stakeholders. The updated version of 2008 was endorsed by the Australian and Queensland governments, and it recognised that the *2003 Reef Plan* had not been effective at solving the declining water quality entering the Reef (Queensland Government, 2009). The plan was preceded in 2008 by the Reef Rescue program, which was a federal government initiative that offered incentives to landholders to improve land management practices. Reef Rescue belonged to the overall CfoC federal environmental initiative. The Reef Rescue program had a budget of A$200 million, the highest amount to date invested in water quality planning (Reef and Rainforest Research Centre, 2015).

Once the *2009 Reef Plan* was endorsed by the two levels of government, Reef Rescue was incorporated into the Reef Plan scheme to become the main implementation strategy of the plan (Queensland Government, 2009). However, during its implementation, the plan and the program created confusion among the stakeholders, highlighting, since its conception a governance issue of collaboration between the federal and state governments. For instance, an audit during plan implementation found that some stakeholders (particularly from the agriculture industry sector) considered that *Reef Rescue* was a separate policy from the *2009 Reef Plan*. Moreover, it was never clear how the program worked under the *Reef Plan* umbrella (Lloyd Consulting, 2010). *Reef Rescue* was seen as a federal program, while Reef Plan was considered a state

level policy, even though Reef Plan was a joint policy from state and federal levels. The plan represented formally the framework in which Reef Rescue was included.

Contrary to the *2003 Reef Plan*, the 2009 plan included a set of water quality and land management practice targets with a five-year time frame of achievement (a change from the 10 year time-frame of the previous plan). These targets were conceived as the strategy to address one of the key objectives of the plan: reduce pollutant loads from land based runoff (non-point sources) in the water entering the Reef. The overall aim of the plan was to halt and reverse the decline in water quality entering the Reef by 2013 (Queensland Government, 2009). The plan was informed by robust scientific evidence through a scientific consensus statement on water quality released on 2008, which stated that the management interventions undertaken so far were not effectively solving the water quality issue (Queensland Government, 2008).

As a consequence, the plan emphasised stronger monitoring and evaluation mechanisms to evaluate implementation progress. Progress was informed through annual report cards produced by the integrative Paddock to Reef monitoring and reporting program (Queensland Government, 2009). The information contained in the report cards provided data on the progress of water quality targets, during the five year time-frame of the plan. For this study, water quality targets achieved in five years represent the water quality outcomes of the plan.

In terms of governance, the plan officially adopted the collaborative approach to improve water quality, shifting the use of 'partnerships' from the 2003 Reef Plan to 'collaboration' in this updated version. Collaborative governance was established in this planning effort, continuing as the governance approach in further plans. The collaborative approach is exemplified by this statement from the state government:

> The Reef Plan is a collaboration between the Australian and Queensland governments. Each has its own actions to deliver in conjunction with natural resource management (NRM) bodies, agricultural industries and landholders (Queensland Audit Office, 2015, p. 13).

In this updated version, the key stakeholders were the same as those of the *2003 Reef Plan* except the local governments, which were excluded from this plan. The regional NRM bodies were also the main actors in the implementation of the plan. In this effort, the Cape York region was added (having not been included in the previous plan), which meant there were now six NRM regions (rather than five) that were subject to the plan

objectives. Collaboration was motivated by the recognition that reducing impacts of land use on water quality was a shared responsibility between state and non-state actors: "reducing the impacts of land use on reef water quality is not solely the responsibility of governments" (Queensland Government, 2009, p. 25). Through the collaborative role of the NRM bodies, the plan expected to engage landholders of each region to adopt land management practices with less land-based runoff, which in turn, had less impact on water quality. For this purpose, the NRM regions received federal funding through Reef Rescue to offer water quality grants to landholders as an incentive to change land management practices.

Formally, the governance arrangements included three key collaborative governance bodies: 1) partnership committee; 2) intergovernmental operational committee; and 3) Reef Plan heads of agencies. The first was designed to ensure a collaborative approach to implementation through the joint efforts of the key stakeholders, such as industry, NRM bodies and government officials. The operational committee was the key decision-making body in operational matters, and had the role of overseeing the implementation of the plan at the operation level. It was integrated by senior officers from government agencies at the state and federal levels. The third body had the role of overseeing implementation at the strategic level and was integrated by chief executives at the federal and state governments.

While the plan did not achieve the water quality targets, it was officially recognised that the collaborative approach to governance was a success as it allowed a partnership model of delivery between the stakeholders that was not achieved by the previous plan (Australian Government, 2014a). However, the official reports on the results of the plan did not detail how collaboration performed and operated, which is what this study intends to find out. A Senate report concluded that the plan had improved coordination between the stakeholders and regions but, nonetheless, delivery of the program remained fragmented (Australian Government, 2015c). More importantly, the collaborative approach was undermined by a business model of implementation (Australian Government, 2015b). This last observation is explored in the case study analysis in Chapter 6.

5.3.3 *2013 Reef Plan* and current water quality planning efforts

The release of the 2013 Reef Plan marked the end of the first 10 years of water quality planning efforts (2003-2013). As the 2014 Outlook Report highlighted, despite the positive progress in managing the water quality issue (e.g. moderate reductions of pollutant loads), the GBR remained under threat and pollutant loads were still high risks to the GBR environmental condition (GBRMPA, 2014). The third update to the Reef Plan was based on the findings of the second Scientific Consensus Statement of 2013 This Statement warned that water quality was still poor and was a major cause behind the declining trends of key ecosystems within the GBR (Queensland Government, 2013). New targets for pesticides, sediments and nutrient pollutant loads were established for another five year time-frame, from 2013 to 2018 (Brodie and Pearson, 2016). According to the latest report card, progress on the new water quality targets since 2013 has been moderate, but it has slightly improved from the previous plans, particularly on the reductions of pesticide loads (Queensland Government, 2017).

In terms of governance, the *2013 Reef Plan* maintains similar collaborative governance arrangements than the 2009 plan as well as the same key stakeholders. In this version though, the Reef Plan heads of agencies, a key collaborative body of the 2009 plan, was removed (Australian and Queensland Governments, 2013). The *2013 Reef Plan* document, on the other hand, devotes a small section to governance, within the heading 'Implementing the Reef Plan.' The official view of governance as central for implementing the plan fits with the focus of this study, which examines governance in the implementation of the *2009 Reef Plan*. Parallel to this latest version of water quality planning, the Australian and Queensland governments developed a 35 year action plan to improve the overall management of the GBR, *Reef 2050 Long-Term Sustainability Plan*. This plan includes water quality among its key themes and incorporates the goals and targets of the 2013 Reef Plan (Queensland Government, 2017).

Currently, within the Reef 2050 planning scheme, a draft *2050 Reef Plan* (2017-2022) is being developed to replace the 2013 version. The plan will seek to address runoff from urban and industrial sources, not only from agriculture activities (Queensland Government, 2017). This new strategy has been criticised by the scientific community. For instance, the Australian Academy of Science concluded that the long-term sustainability plan was inadequate to restore or even maintain the environmental values of the GBR. Moreover, the plan promotes the creation of the world's largest export

industry for coal and coal seam gas (Hughes, et al. 2015).

5.4 NRM regions of the GBR

In 2001, the Australian government established 14 NRM regions in Queensland through the second phase of the NHT program, which sought to improve the management of resources such as land, water and biodiversity (Lockwood et al., 2009). A community-based NRM group was established to govern each region. Its main role was to engage stakeholders and the wider public in the development and implementation of regional NRM plans (Curtis et al., 2014). The creation of NRM regions followed a regionalisation strategy, where the Australian government devolved responsibilities to regions for NRM delivery, while providing limited power and resources to these regions (Robins, 2007). In other words, the NRM regions represented an instrument for policy and planning delivery of natural resources, rather than autonomous entities from government.

The basic governance structure of the NRM bodies is comprised of a board and a management branch. The board is the forum where key representatives adopt decisions, while the management branch is the sub-group that implements these decisions and manages other operations. In other words, the management branch executes the plans and objectives developed by the board. The board is led by a chair, while the management branch is led by a chief executive officer (CEO). The basic structure is complemented by the Regional Groups Collective (RGC), which acts as the representative body for NRM in Queensland. The RGC is designed as a forum of collaboration between the 14 NRM regional bodies (RGC, 2015).

The GBR catchment includes six NRM regions; Burdekin; Burnett-Mary; Cape York; Fitzroy Basin; Mackay Whitsundays; and Wet Tropics. (See Figure 5.3 for more detail.) Each of them are administered and managed by an NRM body. The NRM bodies are non-for-profit and non-statutory organisations. This means that they are a public entity that has no power to enforce legislation. The regions, and their respective NRM bodies, represent the main actors in the delivery of natural resource planning and management, including water quality planning. Since 2003 (as shown in section 5.3), they epitomised the collaborative governance approach through their community-based composition and regional engagement role. For this reason, the NRM regions and their efforts at implementing the *2009 Reef Plan* are a central focus of this study. They represent the

regional scale of governance covered by the first part of the case study.
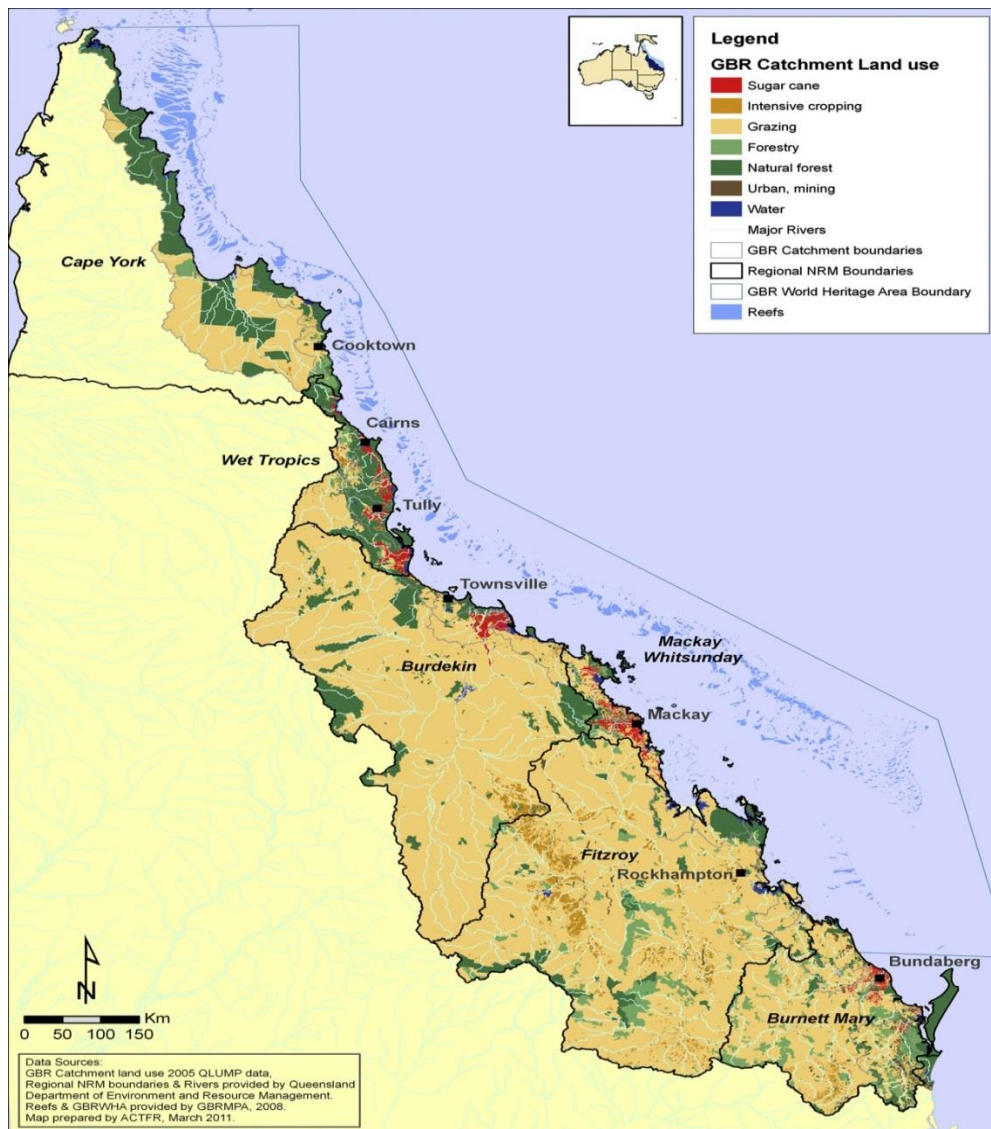
Figure 5.3 The NRM regions in the GBR with their respective land-uses (Brodie and Waterhouse, 2012).

Figure 5.3 shows that each region has different land sizes and land uses. In terms of land size, Fitzroy and Burdekin are significantly larger than the other regions. Considering agricultural land uses, the dominant land-use across the six NRM regions is grazing. Sugarcane is extensive in Mackay Whitsundays and Wet Tropics, and a minor in land use in Burdekin and Burnett-Mary. Horticulture is the third agriculture land-use included in the Reef plan, however the amount of this activity is too low to be in the map.

This map illustrates the differences between NRM regions in terms of the geographic and economic conditions: this then translates into different impacts on water quality in

the GBR. Most of the implementation of Reef plans has been, and remain, at the NRM regions. However, it is worth noting that the regions were — and still are despite their contextual differences — held to the same water quality targets. I explore and analyse these differences in the next chapter, where I develop a typology of NRM regions to highlight the nature of the water quality problem. I also describe their impacts on water quality outcomes through their governance structures, including a proxy variable of collaboration to distinguish amongst their collaborative approaches.

5.5 Conclusion

In this chapter, I presented the background of the case study, highlighting that the GBR is still at a crossroads in terms of its environmental values and condition. In particular, regarding water quality affected by land-based runoff from agriculture. I focused on the water quality issue because it is where collaborative governance was adopted. In terms of water quality then, the GBR is still at a crossroad as the water quality conditions have not improved as expected, despite the water quality planning efforts to improve it. Moreover, water quality remains a major threat for the GBR catchment.

Regarding the water quality planning efforts, in this chapter I give a ten year historical account of water quality planning efforts, from 2003 to 2013. As suggested for case study research by Yin (2014), rather than provide a comprehensive history and background conditions of the case study area, I describe the topic of the case study: water quality planning. The ten year account of water quality planning is represented by three main water quality plans, labelled as Reef Plans 2003, 2009 and 2013. I provided more detail on the *2009 Reef Plan*, as the subject of the case study. I explain how, since the 2003 Reef Plan, collaborative approaches to governing water quality planning were adopted. The collaborative governance approach was formally adopted by the *2009 Reef Plan* and then consolidated in the 2013 version. The plans though, have not achieved the expected outcomes. Time-lags (especially sensitive in environmental issues) are the main official explanation for the moderate progress. But, again, there has been no research on how this collaborative governance approaches and its arrangements impacted on water quality outcomes.

The chapter concluded with a brief profile of the NRM regions, mainly designed to identify their different agriculture land uses and role in the Reef plans. The next chapter

presents the first part of the case study analysis on how collaborative governance impacted on the water quality outcomes achieved by the *2009 Reef Plan*. The chapter focuses on the role of collaborative governance in the plan, and the impact of collaborative governance on water quality outcomes at the regional scale. It also offers a more detailed account of the NRM regions context, which is relevant for the case study analysis.

CHAPTER 6: ROLE OF COLLABORATIVE GOVERNANCE AND IMPACT OF REGIONAL COLLABORATIVE GOVERNANCE APPROACHES ON WATER QUALITY OUTCOMES OF THE GBR

6.1 Introduction

Governing the planning and management of natural resources usually involves a multiplicity of government and non-government actors that interact at different levels of decision-making and implementation. To manage this inherent complexity, NRM and planning efforts have relied on collaboration. Through this collaboration, stakeholders from both state and non-state realms work together to agree upon policy problems and solutions. Collaboration has been considered as an appropriate strategy due to its emphasis on mutual gains and improved trust between the stakeholders as well as increased levels of knowledge-sharing and effective coordination (Ansell, 2012). In other words, bringing together the divergent interests of the stakeholders has the possibility of finding common-ground and action. Collaboration also has the potential to integrate local knowledge and science (Weible and Sabatier, 2009), which are regarded as vital for dealing with environmental problems (Taylor and de Loe, 2012).

Despite this, collaboration is not recommended where there are fundamental value differences between the stakeholders (Wondoleck and Yaffee, 2000). By 'fundamental', the authors mean the existence of irreconcilable views among different actors regarding the central issue and the best means to approach it. In addition, it is not clear whether collaboration leads to better results than other forms of governance, such as markets or hierarchy (top-down). Few studies have focused on evaluating how collaboration differs from other governance modes as a policy strategy for NRM as well as the results it produces in the management of natural resource issues. One of the few studies that has focused on the environmental outcomes facilitated by governance approaches, is a study about water quality outcomes by Weible and Sabatier (2009): they show that, while collaboration tends to promote a convergence between the competing values of stakeholders, the actors involved do not rely more on scientific evidence compared to other governance approaches, such as hierarchical arrangements. In another study concerned with water quality, Koontz and Newig (2014) found, in a series of case studies, that the governance approach (collaborative or top-down) did not decide the results of the policy. Instead, other factors were more decisive such as funds, available

coordinators and networks. Newig and Fritsch (2009), did not find sufficient evidence to determine whether collaboration leads to better ecological outcomes than top-down governance approaches. Their review of more than 40 environmental policies in Europe and North America, revealed a mixed impact on improved compliance and implementation from collaborative and hierarchical modes.

My study, rather than comparing governance modes, considers different approaches to collaboration and the impacts of these on environmental outcomes. For the analysis, environmental outcomes refer to the condition of a natural resource (e.g. land or water) after a planning or policy intervention (Christensen, 2015): more specifically, the "changes in environmental parameters appropriate to a specific resource" (Koontz and Thomas, 2006, p. 115). An environmental outcome would indicate, for example, if the water resource became healthier (or less polluted) as a consequence of a specific environmental plan or policy. There are three types of outcomes: 1) immediate; 2) intermediate; and 3) longer-term or end outcomes. The first refers to changes in the incidence of a natural resource problem or quality of an environmental public service. Intermediate outcomes are the measured changes in the natural resource conditions that increase the likelihood of future improvements in the resource. Longer-term outcomes are the measured reduced rates of recurrence of a natural resource issue, such as degradation or exploitation (Emerson and Nabatchi, 2015). In this study, I focus on the intermediate outcomes produced by a policy founded on collaborative governance.

In order to present the analysis, the chapter is divided in three sections. First, I present the methods followed to collect and analyse the data to address the first and second research sub-questions of the thesis (which frame this results chapter). Then, I offer the answers to the research sub-questions (role of collaborative governance and impact of regional collaboration) based on the evidence provided by data and interviews. In this part, I explain the different impacts of collaborative governance at the regional scale, following regional context and governance structures as well as the proxy variable for collaboration. In the fourth and final part, I discuss the findings in the six NRM regions based on the regional evaluation of the impact of collaboration on water quality outcomes. I also offer the implications of this analysis, explaining the relationship between collaborative governance and environmental outcomes as well as implications for further research.

6.2 Methods

6.2.1 Governance and collaboration

I view governance as the series of arrangements in place to structure and govern a policy and planning process. The arrangements are comprised of institutions and rules where decisions are made and implemented (Bevir, 2009). The distinctive quality of the governance arrangements in this case study is their emphasis on collaboration. As stated in Chapter 2, the case study analysis is guided by the definition of collaborative governance provided by Ansell and Gash (2008):

> "A governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programs or assets." (p. 544).

It is worth noting the emphasis in this definition on formal decision-making process as the focus of this study is on the formal processes of collaboration: I disregard any explicit exploration of informal governance, such as informal networks and relationships between stakeholders. However, Ansell (2012) points out that in practice there is an overlap between formal and informal collaboration; hence, along the analysis, I recognise the impact of informal relationships in the collaborative effort.

I complement the definition of collaborative governance by emphasising that the adoption of collaborative governance has the objective of carrying out a public purpose, such as providing a public good (Emerson and Nabatchi, 2015). The focus on implementing a public goal links with this study's focus on environmental outcomes: or, in other words, the attempt to improve an environmental public good. My approach is to analyse governance through its impact upon outcomes rather than its processes, such as quality of the policy process, level of impartiality or bureaucratic autonomy, I coincide with Rotberg (2014), who argues for the importance of focusing on the services delivered (public goods or outcomes) to better understand the performance of a governance approach. Analysing governance through the results it produces tends to minimise normative evaluations (e.g. the World Bank's governance indicators) of governance arrangements (Rotberg, 2014).

In my evaluation of organisations, I include funding and the existence of coordinators

as the key variables to differentiate between the collaborative governance approaches. By funding, I refer to the financial resources available for on-ground delivery (e.g. water quality projects on land to reduce or halt run-off). By coordinators, I refer to staff that led the engagement with the target groups (landholders, in this case) in order to promote behaviour change. The aim is to explore the simple assumption that more funding for on-ground delivery would lead to better environmental outcomes. In the cases presented here, the availability of more financial resources for on-ground delivery did not necessarily lead to better achievement of water quality outcomes.

Therefore, I seek to explain why and how, in some cases, better outcomes were obtained with less funding. For this purpose, I test the assumption that perhaps the cases that achieved better water quality outcomes with less funding had stronger collaboration. I use the coordinators as a proxy variable that would indicate stronger collaboration in these cases. This tests that the existence of an important collaborative element — i.e. coordinators for on-ground delivery of the water quality targets— contributed to achieving better water quality outcomes regardless of funding received. In other words, the existence of a coordinator or coordinators for on-ground delivery would allow suggesting a positive or negative association between collaborative governance and the achievement of environmental outcomes.

6.2.2 Regional evaluation

The case evaluated is located in the state of Queensland in the north of Australia. The policy evaluated in this study is a plan that aimed to improve water quality in the Great Barrier Reef, one of the most important Australian ecosystems. Water quality represents the environmental outcome that was delivered by six NRM regions established along the Reef catchment. In this study, I focus on these six regions that are located in the northern, central and southern areas of the GBR catchment. These were selected as they represent examples of different land uses, funding amounts and environmental outcomes. In this sense, they provide different contexts in which to examine potential different impacts of their collaborative approaches by using the existence of coordinators as the proxy variable for collaboration.

Hence, this is a case-study analysis of the impact of collaborative governance on water quality outcomes within a natural resource planning endeavour. The data collected and analysed was based on a review of official documents that reported on the

environmental outcomes of the policy evaluated, which was complemented with semi-structured interviews of 22 key stakeholders involved directly in the implementation of *Reef Rescue* or that had knowledge of the implementation process and its outcomes. The interviewees were involved in managerial roles. Table 6.1 shows the distribution of the stakeholders per group and interview code. The interviews were analysed and coded using NVivo software (guided by the research questions below). The findings are based on the data about water quality outcomes as well as the perspectives of the actors involved about those same outcomes. Two research questions guided the study:

1. What was the role of collaboration in the implementation of the policy?

2. How regional collaborative governance approaches impacted on the different environmental outcomes achieved by the NRM regions of the GBR?

Table 6.1 Distribution of stakeholders interviewed.

Stakeholder group	No. of Interviewees	Interview code
Federal government	1	FG1
State government	4	SG1, SG2, SG3, SG4
Regional NRM bodies	12	RB1, RB2, RB3, RB4, RB5, RB6, RB7, RB8, RB9, RB10, RB11, RB12
Agriculture industry representatives	4	AI1, AI2, AI3, AI4
Academic sector	1	AS1
Total	**22**	

This study considers the six NRM regions to discuss about the different impacts of regional collaboration on the water quality outcomes achieved by Reef Rescue: Burdekin, Burnett Mary, Cape York, Fitzroy Basin, Mackay Whitsundays and Wet Tropics (referred to as the 'zoom in' phase of Figure 3.3, Chapter 3). The regions cover all the areas where land-based runoff occurs. See Figure 6.1 for more detail. Each of the regions is managed by a community-based and non-profit NRM body. The NQ Dry Tropics (NQDT) group administers the Burdekin region, while Burnett Mary is administered by Burnett-Mary Regional Group (BMRG). Cape York region was managed by Cape York Sustainable Futures (now Cape York NRM). Fitzroy Basin

Association (FBA) manages the Fitzroy region, and Reef Catchments (RC) manages Mackay Whitsundays. The Wet Tropics is identified as the Far North Queensland region in the map, which is managed by Terrain NRM (TNRM). I focus on the level of regional collaboration at each of the six NRM regions.
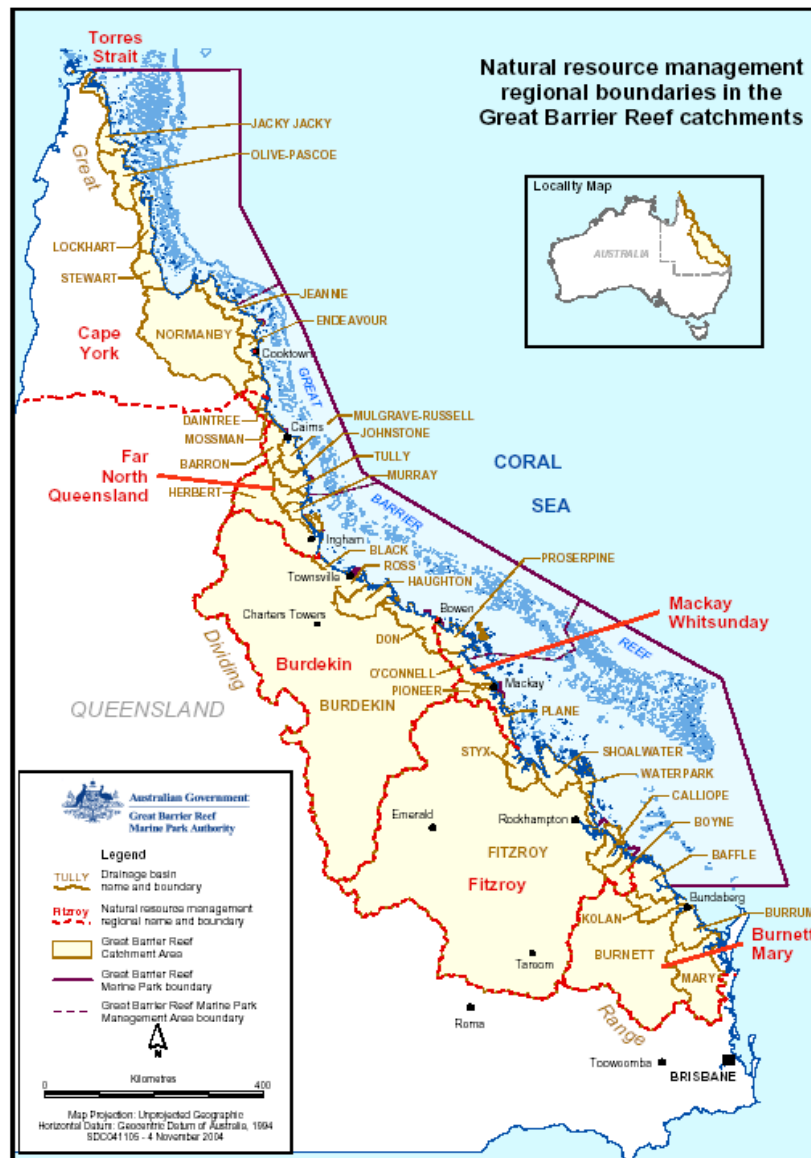
Figure 6.1 NRM regions in the GBR (Queensland Government, 2008).

The results are based on the official data on water quality outcomes, reported by the Paddock to Reef program, as well as interviews with the stakeholder groups previously identified (Table 6.1). *Reef Rescue* was selected for two key reasons: 1) given the focus on outcomes, I chose to study an implementation strategy as it is where outcomes are produced (in this case, the A$200 million for *Reef Rescue* represented the highest funded implementation component of the *2009 Reef Plan*, while the other component

was the A$50 million invested by the state government in regulations); and 2) *2009 Reef Plan* was selected as it was one of the very few programs within Queensland's water quality planning that included factual information about environmental outcomes rather than merely outputs (e.g. plans developed or the activities that lead to the outcomes).

6.3 Results

6.3.1 Governance arrangements

Since the first decade of the 2000s, collaborative governance approaches have been used in Australia to address the degradation of natural resources. The governance arrangements are characterised by the participation of state and non-state actors in a multi-level setting of governance domains: federal, state, regional and local. In the NRM context, the regional level of governance plays a central role as the federal level established NRM regions within each Australian state based on the ecosystem boundaries. Through the NRM regions, the federal level devolved management and planning responsibilities to the regional level. Each region is governed by an NRM community-based body. In the Great Barrier Reef catchment there are six NRM regions along the 2,300 km coastline.

Due to the increasing levels of pollution and rising sea temperatures, the first Reef Plan was developed in 2003 to deal with water quality, which was mainly impacted by the intensive agriculture practices undertaken in the regions. Agriculture land use covers more than 82% of the GBR catchment. Of this agricultural land use, 75% is devoted to grazing, 1.3% to sugar cane and the rest to other smaller land-uses such as horticulture and dairy farming (Australian Government, 2014a). After the planning intervention of 2003, water quality had not improved significantly. Hence, in 2007 stakeholders from the regional bodies, agriculture industry and conservation sectors joined together to lobby the federal government to develop a new proposal for dealing with water quality. In 2008, this proposal became the *Reef Rescue* program, which later became part of the investment strategies of the *2009 Reef Plan* (Queensland Government, 2009). *Reef Rescue* was developed by the federal level, while the *2009 Reef Plan* was established by the state and federal governments. The *2009 Reef Plan* represented the collaborative framework through which *Reef Rescue* was implemented.

The main purpose of the *2009 Reef Plan* was to halt and reverse the decline in water quality entering the Reef by 2013 (Queensland Government, 2009). The plan introduced specific targets to reduce the 'feeders' of non-point source pollution: nitrogen, pesticides and sediments, which were caused by agricultural run-off. Land-based runoff is considered one of the main threats to the health and resilience of the GBR, along with climate change, coastal development and port activities (Queensland Government, 2016). *Reef Rescue* represented an incentive-based and collaborative strategy directed towards agriculture producers to change their land management practices (Australian Government, 2011).

The main stakeholders involved in this policy were the federal and state governments (three government agencies, respectively); six regional NRM bodies; agriculture industry (sugarcane, grazing, horticulture and other marginal land-uses); the conservation sector (represented by an international conservation NGO); and academic researchers, who contributed the scientific evidence of the declining health of the Reef that underpinned the *2009 Reef Plan* (Queensland Government, 2008). The federal government invested $200AUSmillion dollars through the *Reef Rescue* program in the five-year period of 2008-2013 (Australian Government, 2011). It allocated the funding directly to the NRM bodies to deliver the policy. This was done in a top-down fashion as the funding criteria were developed solely by the federal level.

The collaboration of the *2009 Reef Plan* occurred mainly between the six regional NRM bodies and the agricultural organisations within those regions. They worked together to motivate the producers to change their behaviour towards more sustainable agriculture practices. Dealing with water quality became then a matter of promoting sustainable agriculture. However, collaboration also occurred between the regional NRM bodies and the federal and state governments. There were two collaborative arrangements taking place simultaneously in a multi-governance setting: a high collaborative domain and a regional one (Figure 6.2).

Within these collaborative arrangements, the central actors were the regional NRM bodies, which canalised the funding received from the federal government. The funds were distributed to the landholders through a competitive grant process, in collaboration with the regional agriculture organisations. The collaborative arrangements were complemented by a top-down approach from the federal and state governments to the regional domain of collaboration. Both governments decided the objectives and

priorities of the policy. The federal level decided and allocated the funds for *Reef Rescue*, while the state level introduced regulations in 2009 to promote practice change during the implementation of the policy (Reef and Rainforest Research Centre, 2015).
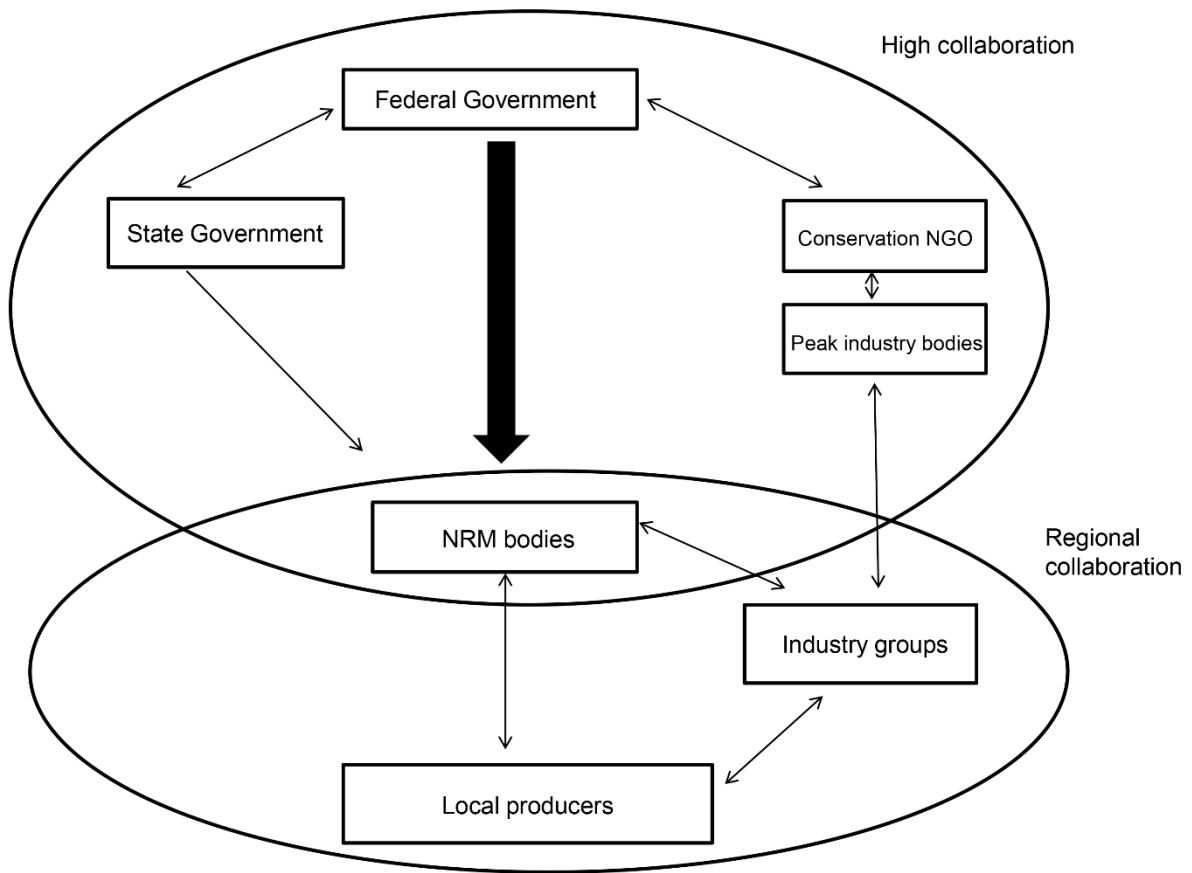
Figure 6.2 Overview of collaborative governance arrangements during implementation of *2009 Reef Plan* (developed by author).

The arrows in both directions indicate collaboration between the stakeholders; whereas the arrows in one direction indicate a top-down directive.

6.3.2 Role of collaboration

The water quality outcomes achieved by the regions were based on an implementation strategy that relied on regional collaboration. This type of collaboration, according to the interviewees from the regional NRM bodies, consisted of the NRM groups working together with regional agriculture industry organisations to promote the voluntary adoption of more sustainable management practices among the landholders. The

instrument used to engage the landholders was grants that were awarded through a competitive process of project selection. Collaborative governance adopted the style of a formal working relationship between non-state actors that relied on a key policy instrument: incentives. The landholders also collaborated in achieving the environmental outcomes through their voluntary participation in exchange for grants. Nevertheless, there were landholders who did not participate at all in this collaborative scheme.

Despite the limited scope of collaboration, all the stakeholders from the six regional NRM bodies interviewed argued that regional collaboration was essential for implementing the water quality policy and achieving its outcomes. This was also shared by around 80% of the stakeholders from the other stakeholder groups interviewed. In general, the stakeholder views were that the main benefit of collaboration is that it allowed sharing information as well as best practices. No water quality outcome would have been achieved without collaboration and, overall, all the stakeholders interviewed consider that the *2009 Reef Plan* was an example of successful collaboration in the GBR water quality issue. This was also the conclusion of the final report on the achievements of the plan (Australian Government, 2014a). In this study, I avoid discussions about success or failure of the policy analysed: rather I focus on the outcomes achieved by each region, and contrast those outcomes with the original targets.

For the interviewees from the regional NRM bodies, the relationships developed between the NRM groups and the regional agricultural bodies for sugarcane or grazing were essential for engaging the landholders in changing their practices. Collaboration with the state and federal levels was less important, and it occurred mainly through reporting and informing these levels about implementation progress. According to interviewee RB4, staff from the federal government met with the regions twice each year to oversee the coordination efforts. The state government, though, never met with them. Collaboration between the NRM regions was also rare:

> "A lot of times it was just learning, you know, sharing of information from government down, there wasn't a lot of sharing across (NRM regions), which I think that was what was meant to do" (RB8).

More than 80% of the stakeholders from the regional NRM bodies (10 out of 12) did not

mention collaboration across the NRM regions as part of the collaborative governance arrangements, despite the existence of the Regional Groups Collective (RGC), which is the coordinating body of 13 regional NRM groups (including the six Reef NRM regions). Interviewee RB10, however, stated that the RGC allowed regular discussions between the NRM groups. On the other hand, around 15% of the interviewees (two out of 12) considered that, in practice, there was no collaboration in the governance arrangements to implement *Reef Rescue*:

> "What collaborative arrangements? There weren't any real collaborative arrangements in place during Reef Rescue (…) some had working relationships with other stakeholders, some didn't. This was based on how each NRM regional group works within their respective region" (RB7).

This quote from interviewee RB7 suggests that informal collaboration might have been more important, as it depended on how each NRM group worked within their region, and not really on how they all followed the formal collaborative arrangements that framed the policy. As interviewee RB1 pointed out, the NRM bodies managing the regions are different organisations with different rules and styles of management. Hence, even though they have the same structure — comprised by a community-based board and an operational body led by a chief executive officer (CEO) — the regions have different rules (e.g. different constitutions) and ways of operating informally (more detail of the governance structures of the six regional NRM bodies are described in Table 6.8.

Regarding collaboration at the higher levels of government — the 'high collaboration' dimension of Figure 6.2 — around 70% of interviewees (except from the federal and state governments) tend to view it more as a top-down strategy developed by the state and federal levels for the regional level. The stakeholders from the regional NRM bodies said that, sometimes, particularly the landholders did not even distinguish between the two levels of government. They viewed the government as one entity commanding the policy. For them, collaboration was merely a working relationship to 'get things done'. In other words, the case study represents an example of limited collaborative governance between state and non-state actors. One that was limited to the pragmatic goal of delivering a water quality plan.

Nonetheless, collaborative governance in the *2009 Reef Plan* was mixed with regulations. The regulations were introduced by the Queensland government during the

implementation of the policy and their main purpose was to advance change in management practices between the reluctant landholders. Regulations represented the 'stick' of the *2009 Reef Plan,* while the incentives administered through *Reef Rescue* represented the 'carrot'. For this reason, interviewees from the regional NRM bodies and agriculture sector considered that the state government should not be included in the collaborative arrangements of the policy. The interviewees from the federal government as well as the conservation sector though did consider the state government in the collaborative framework of the *2009 Reef Plan.* Interviewee RB5, for example, commented that due to the regulations, some landholders would collaborate out of fear of being wrong and being told by the state government that they could no longer farm:

> "It is an implied threat by them, I don't know if it's really real, I mean you've also got the state government with their Reef regulations saying 'you must do this this way or else, you are gonna get fined, you are gonna…this' you know. That is a fear-based process and growers are fearful" (RB5).

The interviewees, however, did not mention examples of any penalties imposed, such as an agricultural business losing its operating license for not complying with the *2009 Reef Plan.* In addition, the official report on the achievements of *Reef Rescue* emphasises the collaborative component of the policy, with no mentions about the role of regulations (Australian Government, 2014a). Apart from being limited, collaborative governance was grounded by regulations in the attempt to establish a minimum standard among the land management practices. Thus, the collaborative approach was combined with more centralised approaches to governance, represented by regulations. Collaborative governance in the Reef catchment's water quality policy might have been reinforced or contradicted by regulations. However, exploring that issue is out of the scope of this chapter. It is discussed in the next chapter of this thesis.

Regional collaboration, according to the stakeholder perceptions, was decisive to implement the *2009 Reef Plan* and, within this regional level, the different approaches to collaboration for each region were more important in determining the achievements (or lack of achievements) in terms of water quality outcomes. In order to explore the likely impact of collaboration per region, the next section focuses on the water quality outcomes achieved per region as well as on the coordinators proxy and how it interacted with the funding for on-ground delivery of the regional water quality

outcomes.

6.3.3 Impact of regional collaboration on regional water quality outcomes

6.3.3.1 Water quality outcomes: a typology of NRM regions

The *2009 Reef Plan* targeted intensive agriculture activities, such as grazing and sugarcane cropping to improve water quality. The policy followed the 2008 *Scientific Consensus Statement on Water Quality* in the GBR, which identified agriculture as the main contributor of non-point source pollution in the GBR catchment, generating mainly sediments, nitrogen and pesticides (Queensland Government, 2008). In terms of land-use, the six regions are dominated by grazing. The Fitzroy and Burdekin regions have the highest proportion of grazing, 78% and 90% of their land uses, respectively. Mackay Whitsundays and the Wet Tropics have the biggest percentage of land devoted to sugar cane, 18% and 9%, respectively. The Fitzroy Basin is the only region within the GBR catchment that does not produce sugar cane. Horticulture and conservation represent the other land uses. Horticulture has a minor contribution though to the land uses in the six NRM regions, representing merely 1% in Burnett Mary and 0% in the rest of the regions. In the case of Cape York, the percentages of its proportion of land uses were not available. However, its effort at reducing water pollutants was focused only on grazing (Queensland Government, 2014). Figures 6.3 to 6.7 below illustrate the proportion of land uses per region (except for Cape York). Within each region, I include the land area devoted to conservation in order to provide a contrast between the agriculture land uses. However, I do no not consider the potential influence that conservation land uses might have on water quality.

Regarding the general contribution of each land use on the GBR's non-point source pollution, sugarcane is the major producer of nitrogen, contributing with 56% of the total impact, even though this agriculture activity accounts for only 1.3% of total agriculture land use in the GBR catchment (Australian Government, 2014b). Grazing covers 75% of total agriculture land use, and contributes mostly with sediments, which account for around 45% of total sediments in the GBR (Australian Government, 2014b). Pesticides are also produced mostly by sugar cane; however, there is no specific percentage reported on the industry's impact. Pesticides are, rather, a combination of all the agriculture land-uses. I refer to the pollutant reductions in nitrogen, sediments and pesticides as the water quality outcomes of *Reef Rescue*, because they indicate

the extent to which the health of the water in the GBR catchment was improved. The water quality outcomes were mainly the result of engaging landholders to change their land management practices. However, in the official documents it is unclear if there was a cause-effect relationship between land management practices and water quality outcomes.

Burdekin Land Use
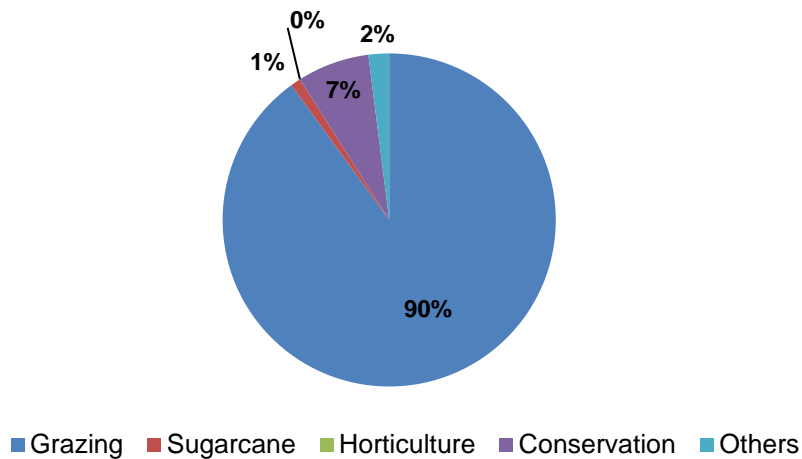
Figure 6.3 Burdekin land uses (Alluvium, 2016).

Burnett-Mary Land Use
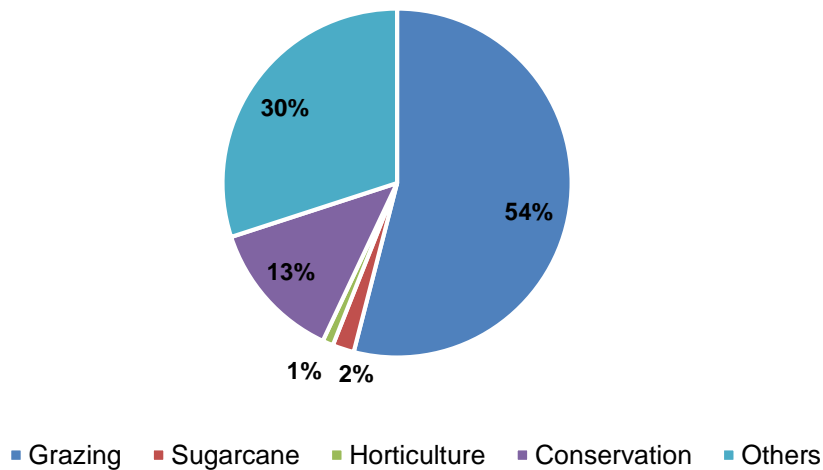
Figure 6.4 Burnett-Mary land uses (Alluvium, 2016).

Fitzroy Basin Land Use

■ Grazing ■ Sugarcane ■ Horticulture ■ Conservation ■ Others

14%

0%
0%

8%

78%
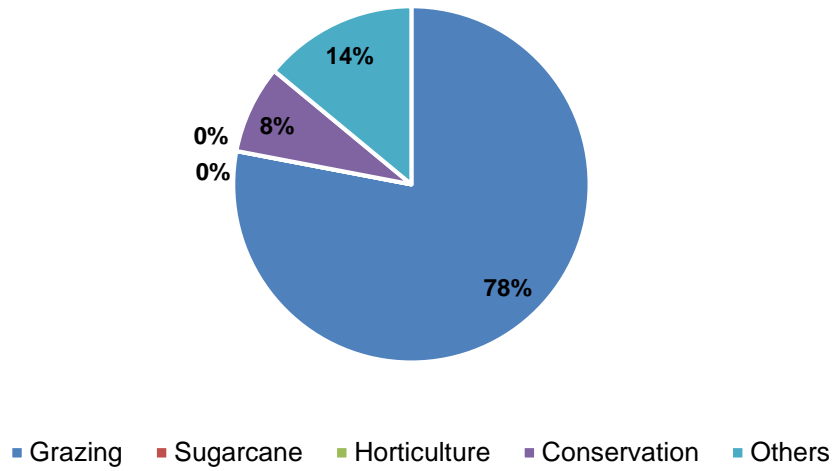
Figure 6.5 Fitzroy Basin land uses (Alluvium, 2016).

Mackay Whitsundays Land Use

21%

17%

0%

18%

44%

■ Grazing ■ Sugarcane ■ Horticulture ■ Conservation ■ Others
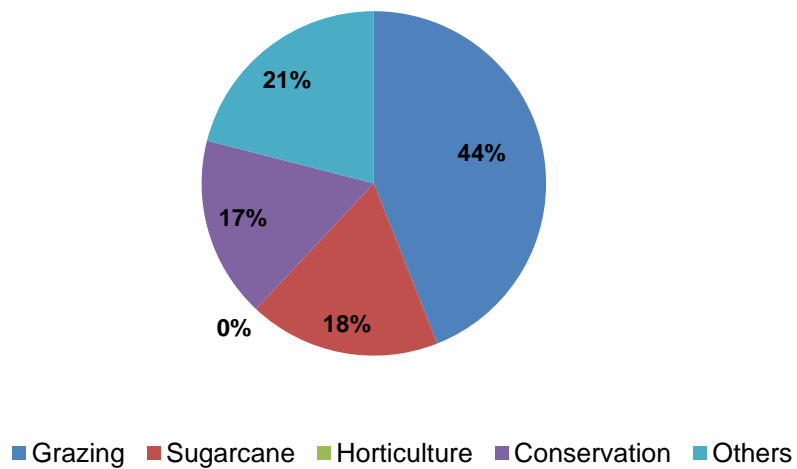
Figure 6.6 Mackay Whitsundays land uses (Alluvium, 2016).

Wet Tropics Land Use
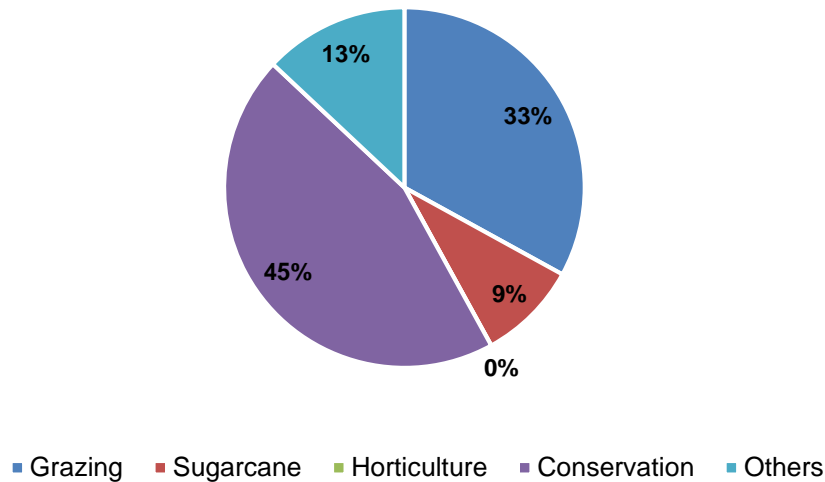
Figure 6.7 Wet Tropics land uses (Alluvium, 2016).

The *2009 Reef Plan* that informed *Reef Rescue* included three targets to reduce the impact of agriculture activities on the GBR's water quality, based on three key pollutants from land run- off: nitrogen, sediment and pesticides. The targets were the same for all the six NRM regions and consisted in reducing by 50% nitrogen and pesticides by 2013 (a five year time frame that began on 2008), as well as reducing sediments by 20% in 2020 (a longer time frame of 12 years). In order to compare the NRM regions and their water quality outcomes achieved, it was necessary to classify them according to the nature of the water quality problem in each region. As the six of them have different contexts, a typology was developed to link the size of the water quality problem in each region and their results in terms of pollutant reductions in nitrogen, sediments and pesticides. The typology included three categories according to similarities in five variables: 1) land area; 2) climate; 3) population; 4) land use; and 5) pollutant loads.

The first category is titled 'Big/Dry/Graze' (BDG). It includes the Burdekin and Fitzroy Basin regions, which have extensive land areas, dry climate, and land use dominated by grazing. The category also includes mild population sizes, i.e. below 250,000 persons, and a high impact of sediments on land-based runoff due to the intensive grazing activities undertaken in these regions (grazing produces the highest amount of sediments). Table 6.2 below shows in more detail the BDG regions.]

Table 6.2 'Big/Dry/Graze' regions in the GBR (Dougall et al., 2014a; Dougall et al., 2014b).

Region	Land area (km^2)	Climate	Population	Problem nature (regarding land use)	Impact on water quality (pollutant loads)
Burdekin	141,000	Dry	240,000	Grazing (90%)	Sediment – 46.5% Nitrogen – 27.5% Pesticides – 12.5%
Fitzroy Basin	156,000	Dry	230,000	Grazing (78%)	Sediment – 22.8% Nitrogen – 11.6% Pesticides – 3.5%
Totals	**297,000**		**470,000**		**Sediment – 69.3%** **Nitrogen – 39.1%** **Pesticides – 16.0%**

Each of the regions within the BDG category achieved different water quality outcomes during the five year period of the *Reef Rescue* program, embedded in the *2009 Reef Plan* scheme. Burdekin was managed by NQ Dry Tropics and Fitzroy by the FBA. Given their problem nature and impact on water quality, the most important outcome of this category is sediment. In this regard, Burdekin achieved three times the reduction in sediment of Fitzroy Basin: the Burdekin reduced its sediment load by 16%, while Fitzroy Basin reduced its sediment by 4%. (See Table 6.3 for more detail on the water quality outcomes achieved by region.) The impact of Burdekin on water quality in terms of sediments was more than double the impact of Fitzroy Basin, 46.5% versus 22.8%; while the land area of Fitzroy Basin is more extensive, 15,000 km^2 bigger than Burdekin.

In terms of nitrogen reductions, Burdekin achieved more than three times the reduction of Fitzroy Basin, 10% and 3% respectively. In this case, Fitzroy Basin nitrogen loads had 11.6% more impact on water quality than Burdekin. It accounted for 39.1% of nitrogen loads, whereas Burdekin's contribution of nitrogen on the Reef's water quality represented 27.5%. In the last water quality outcome, pesticide reductions, again Burdekin achieved a better outcome than Fitzroy, with more than double the reduction in pesticides, 13% and 5% respectively. The impact on water quality in terms of pesticides was 9% higher for Burdekin. In summary, the Burdekin region achieved better water quality outcomes than Fitzroy Basin in the three water quality targets of the *2009 Reef plan*.

Table 6.3 Water quality outcomes achieved by the 'Big/Dry/Graze' regions (Queensland Government, 2014).

Region	NRM Group	Reduce nitrogen by 50% (by 2013)	Reduce sediment by 20% (by 2020)	Reduce pesticides by 50% (by 2013)
Burdekin	NQ Dry Tropics	10%	16%	13%
Fitzroy Basin	FBA	3%	4%	5%

The second category of the water quality typology is 'Small/Tropical/Sugar' (STS), which comprises the Mackay Whitsundays and Wet Tropics regions. This category includes regions with small land areas (below 25,000 km^2) tropical climate and the highest sugarcane land uses. Even though grazing is the largest land use in these areas, their key difference with the other regions is that they represent the most extensive regions dedicated to sugar cane production, contributing with 40.8% of nitrogen loads to the GBR catchment. It is important to note though, that the BDG regions have a slightly lower contribution of nitrogen loads, 39.1%. Hence, the regions in this category also have an important impact in terms of nitrogen. The most significant difference is that the STS regions have the smallest land areas but the highest impact of nitrogen on water quality. The regions in this category also have the highest impact of pesticides on water quality, accounting for 75% of the total contribution of pesticide loads. On the other hand, while these regions have the smallest land areas, their population size is the biggest, both with half million people living in their regions. Table 6.4 shows the STS regions in more detail.

Table 6.4 'Small/Tropical/Sugar' regions in the GBR (Packett et al., 2014; Hateley et al., 2014).

Region	Land area (sqkm)	Climate	Population	Problem nature (regarding land use)	Impact on water quality (pollutant loads)
Mackay Whitsundays	9,000	Tropical	250,000	Sugarcane (18%)	Sediment – 6.0% Nitrogen – 7.7% Pesticides – 23.6%
Wet Tropics	22,000	Tropical	250,000	Sugarcane (9%)	Sediment – 14.3% Nitrogen – 33.1% Pesticides – 51.4%
Totals	31,000		500,000		Sediment – 20.3% Nitrogen – 40.8% Pesticides – 75.0%

Regarding the water quality outcomes achieved by STS regions, nitrogen reductions were the most important due to the nature of the water quality problem in this category. Mackay Whitsundays, managed by Reef Catchments, achieved double the reductions

in nitrogen than were achieved by the Wet Tropics, managed by Terrain NRM. For nitrogen, a reduction of 17% was achieved by Mackay, whereas Wet Tropics obtained an 8% reduction. (See Table 6.5 for more detail.) It is important to note that, in terms of nitrogen loads, the Wet Tropics had an impact on water quality 25.4% higher than Mackay Whitsundays, 33.1% versus 7.7%. Additionally, the land area of Wet Tropics is greater, at 13,000 km^2 larger than Mackay Whitsundays.

In the case of sediments, Wet Tropics had a better water quality outcome, achieving a reduction in sediments of 13%, compared to 9% of the Mackay region. Wet Tropics managed to achieve this despite having a significantly higher impact of sediments on water quality, 8.3% more than Mackay (14.3% versus 6.0%). Looking at pesticides, Mackay Whitsundays had a better outcome, as it managed to reduce them by 42%, while Wet Tropics did by 26%. In terms of the contribution of pesticides on water quality, Wet Tropics had also a bigger impact, 27.8% higher than the Mackay region (51.4% against 23.6%). In general, Wet Tropics had a bigger impact on water quality in the three targeted pollutants, nitrogen, sediments and pesticides. However, Mackay Whitsundays achieved better water quality outcomes in two of them: nitrogen and pesticides.[4]

Table 6.5 Water quality outcomes achieved by 'Small/Tropical/Sugar' regions (Queensland Government, 2014).

Region	NRM Group	Reduce nitrogen by 50% (by 2013)	Reduce sediment by 20% (by 2020)	Reduce pesticides by 50% (by 2013)
Mackay Whitsundays	Reef Catchments	17%	9%	42%
Wet Tropics	Terrain NRM	8%	13%	26%

The third and final category of the water quality typology is 'Medium/Tropical/Mild' (MTM). Two regions comprise this category, Burnett Mary and Cape York. The first is managed by the BMRG and the second was managed by Cape York Sustainable Futures. Cape York is now managed by Cape York NRM. The regions in this category have land areas of medium size, above 25,000 square kilometres, their climate is tropical as the STS category, and they relatively benign or 'mild' distribution of land uses, as none of them (grazing, sugar cane or horticulture) can be distinguished as having a

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[4] In general, there appears to be no linear relationship between each region's impact on water quality (in terms of pollutant loads) and water quality outcomes achieved. For example, having a wider pollutant load impact does not necessarily translate in achieving a wider percentage or reduction in this pollutant.

predominant impact on water quality, unlike the other two categories.

Moreover, the impact on water quality of their land uses is mild in terms of their nitrogen, sediment and pesticides pollutant loads. Compared to the other categories, their contribution loads in percentages to water quality is significantly lower (under 15% in the three pollutants). On the other hand, data on land use was not available for the Cape York region, but it is possible to infer that, as with Burnett Mary, grazing has the highest proportion of land use due to the fact that the efforts to change land management practices in this region were only directed towards grazing (Queensland Government, 2014). In terms of their population, Burnett Mary has the highest number of people among the six NRM regions (more than half million), while Cape York has the lowest population with less than 10,000 persons living in the area. Table 6.6 provides details on the MTM category.

Table 6.6 'Medium/Tropical/Mild' regions in the Great Barrier Reef (Fentie, et al., 2014; McCloskey, et al., 2014).

Region	Land area (km^2)	Climate	Population	Problem nature (regarding land use)	Impact on water quality (pollutant loads)
Burnett Mary	53,000	Subtropical	300,000	Mixed	Sediment – 5.4% Nitrogen – 6.0% Pesticides – 9.1%
Cape York	43,000	Tropical	7,490	Mixed	Sediment – 5.0% Nitrogen – 14.1% Pesticides – 0.0%
Totals	96,000		307,490		Sediment – 10.4% Nitrogen – 20.1% Pesticides – 9.1%

In the water quality outcomes achieved by the regions of the MTM category, Burnett Mary reduced by more than double than Cape York the nitrogen loads, 15% against a 6% reduction of Cape York. This far north region, however, had a higher contribution of nitrogen loads (by 8.1% more) than Burnett Mary. Table 6.7 shows the water quality outcomes of this category. In sediments, the second water quality outcome, Cape York had a better result, reducing by more than double the sediment loads achieved by Burnett Mary, 8% and 3% respectively. The sediment loads of both regions had practically the same impact on water quality, with around 5% of sediments contribution. In the case of pesticides, Cape York did not achieve any reductions as the region had no pesticides impacting the water quality of the Reef. Burnett Mary achieved a 28% reduction of pesticide loads in the catchment, where it had an impact of 9.1% of total

regional pesticide loads.

Overall, in the MTM category, neither region achieved better water quality outcomes overall. Burnett Mary, for instance, achieved better water quality outcomes in nitrogen, while Cape York did better on sediments. It is not possible to compare the pesticides outcome because Cape York did not have any contribution of pesticide loads on water quality. Hence, pesticides were not an issue in this region. Burnett Mary, on the other hand, achieved the second highest reduction of pesticides, (behind Mackay Whitsundays and above Wet Tropics), despite that their contribution of pesticide loads was minor compared to the regions in the STS category, which had a contribution above 20% of the total pesticide loads on the Reef's water quality.

Table 6.7 Water quality outcomes achieved by 'Medium/Tropical/Mild' regions (Queensland Government, 2014).

Region	NRM Group	Reduce nitrogen by 50% (by 2013)	Reduce sediment by 20% (by 2020)	Reduce pesticides by 50% (by 2013)
Burnett Mary	BMRG	15%	3%	28%
Cape York	Cape York Sustainable Futures (now Cape York NRM)	6%	8%	0%

A key consideration with these results is that the percentages for the water quality outcomes are based on estimates from a modelling program developed by the state and federal governments. Therefore, they do not represent actual reductions of pollutant loads; rather, they are projections based on the *Paddock to Reef* model program (Queensland Government, 2017). In addition, the figures reported by *Paddock to Reef* are based on data that each region provided to both government levels. They all had different methods of obtaining and reporting that data. Hence, it is uncertain to what extent they reflect the real achievements.

It is possible to provide a general picture on the nature of the water quality problem by combining the land area and the impact on the GBR's water quality (in terms of pollutant loads) of each category in the typology for each NRM region. This shows which regions have the highest impact in the water quality issue and how this, in turn, relates to the size of their land area. Figure 6.8 illustrates that the larger impacts of pollutant loads focus on the regions of the BDG and STS categories. The first comprises the largest land area (297,000 km^2) and has, by far, the largest impact on sediments, accounting

for 69.3% of the total sediment loads, while the latter encompasses the smallest land area (merely 31,000 km^2) but has the biggest impact on nitrogen and pesticide loads (40.8% and 75.0%, respectively of the total nitrogen and pesticide loads in the GBR catchment).

Regarding nitrogen loads, the BDG category, at 40.8%, has almost the same impact as STS, with 39.1%, despite the land uses in this category being heavily focused on grazing, which is the major agricultural activity that contributes sediments. In contrast, the impacts of the MTM category are moderate, particularly in sediment and pesticide loads. Figure 6.8, also shows that the water quality problem concentrates in the larger and smaller categories (in terms of land area) of the typology, where two intensive agriculture land uses take place: sugarcane and grazing.

Impact by Land Area and Pollutant Loads
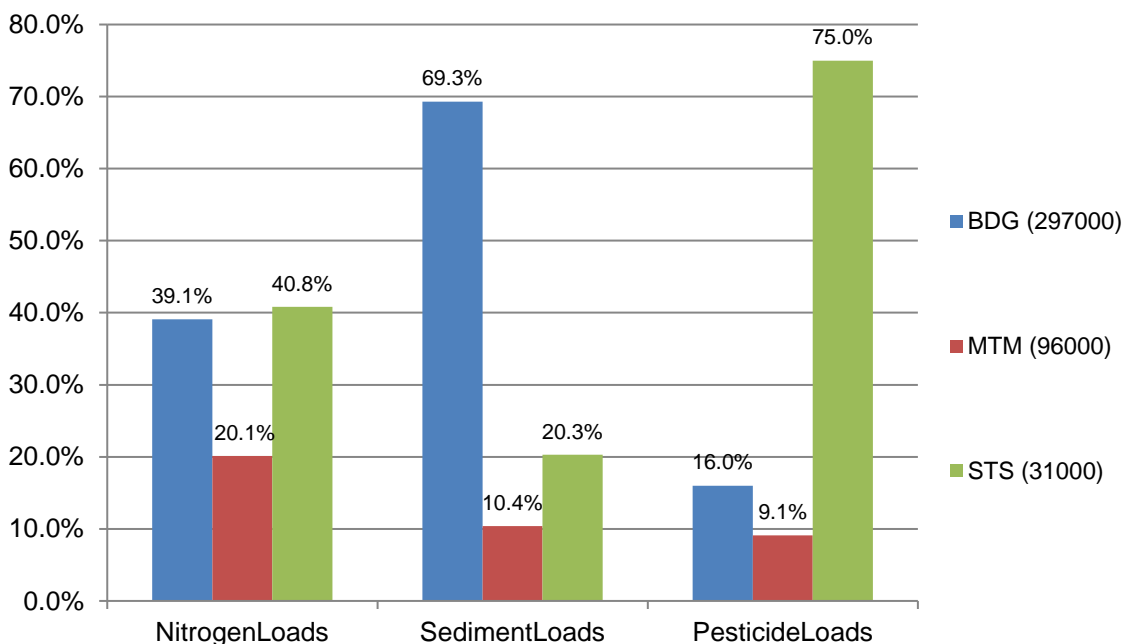
Figure 6.8 Nature of the water quality problem per category of the typology on NRM regions.

Given impacts on water quality of BDG and STS category, it is not surprising then that most of on-ground funding was allocated to the two regions of these categories. The regions in the BDG category received 42% of the total *Reef Rescue* incentive-based funding, whereas the STS category captured 44% of total funding. The MTM category received the rest, 14% of total funding, which is a significant reduction from the other

categories. However, the regions in this category achieved similar or even better water quality outcomes than the regions in the two better funded categories. Figure 6.9 shows the amounts in AUS dollars received by each category of the typology. Overall, this Figure suggests that the allocation of funds for the regions was mostly based on the impact on water quality that each region had in terms of nitrogen, sediment and pesticides loads. For example, the STS category had the biggest percentage impact of nitrogen and pesticides on water quality and, in consequence, received the highest amount of funding. The BDG category had the highest percentage impact of sediments on water quality and received the second highest amount of funds to implement the 2000 Reef Plan objectives.

Reef Rescue funds (AUS million)
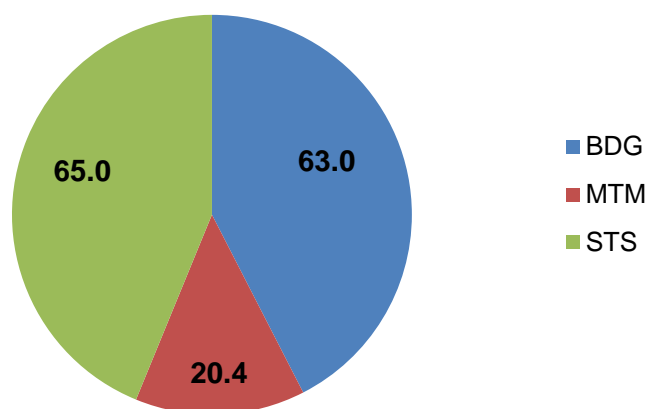
Figure 6.9 Funds allocated by *Reef Rescue* per category for NRM regions (based on the figures in BMRG, n.d.; CY, n.d.; FBA, n.d.; NQDT, n.d.; RC, n.d.; and TNRM, n.d.) .

The funding was allocated by the federal government based on multiple criteria analysis (MCA) developed by the stakeholders. The MCA suggested prioritising the regions with extensive grazing land uses as they delivered the largest pollutant loads to the catchment (Australian Government, 2014b). Fitzroy and Burdekin were the ones recommended by the MCA. However, the official document about the achievements of *Reef Rescue* does not specify how the federal government made the decisions to allocate the regional funds for on-ground delivery. For instance, as Figure 6.9 shows, despite the MCA advice and by a slight difference of A$2 million, the STS regions received more funding than the BDG one. The most important thing to highlight though

is that, taken individually (without reference to the typology categories) each region received different amounts of funding for on-ground delivery to achieve the same water quality targets.

Figure 6.10 shows the amount of on-ground funds received by each region, which were administered by the respective regional NRM groups. Mackay Whitsundays did not receive the highest amount of funding, but it was the region that achieved the best water quality outcomes on nitrogen and pesticides reductions, 17% and 42% respectively (out of an original target of 50% reduction). Burdekin was the second region with the highest amount of funds available (behind the Wet Tropics), and it achieved the best water quality outcome on sediment reductions, with 16% (out of an original target of 20% reduction).

Funding per NRM region 2008-2013 (AUS million)
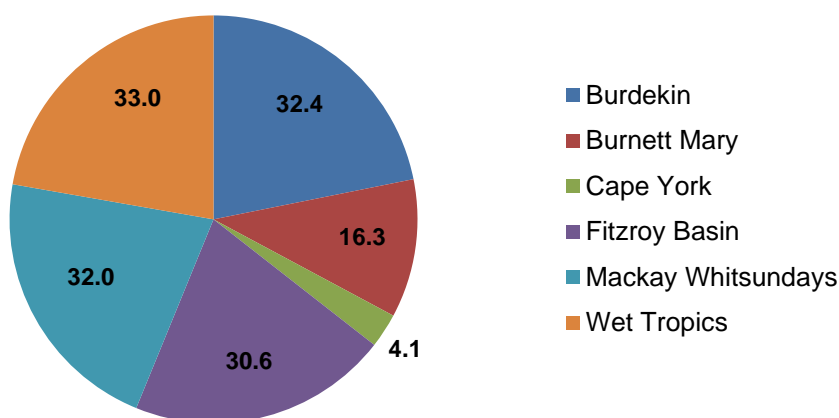
Figure 6.10 On-ground Funding per NRM region during *Reef Rescue* (BMRG, n.d.; CY, n.d.; FBA, n.d.; NQDT, n.d.; RC, n.d.; and TNRM, n.d.).

Considering each region's water quality outcomes, what stands out is that some of the NRM regions that has less funding available for on-ground delivery achieved better water quality outcomes than regions that had more funding allocated. For example, the second best water quality outcomes in terms of nitrogen and pesticides reductions were achieved by Burnett Mary, despite having less than half the funds of Wet Tropics, the top-funded region in the GBR. In this regard, Wet Tropics did not achieve the best water

quality outcomes in any of the pollutants targeted by the *2009 Reef Plan*. On the other hand, Cape York received the lowest amount of funds for on-ground delivery but achieved a reduction in sediments two times higher than Fitzroy Basin, a grazing region that received more than seven times the funding allocated to Cape York (A$30.6 million and A$4.1 million, respectively). As a consequence, it can be argued that more funding for regional on-ground delivery does not necessarily led to the achievement of better regional water quality outcomes.

On the other hand, it is worth noting that, generally the water quality outcomes achieved by the six regions fell short of the original targets of the *2009 Reef Plan*. As a consequence, the overall water quality condition of the GBR catchment within those regions remained poor (Queensland Government, 2014). Moreover, before *Reef Rescue,* the water quality condition of the GBR was considered poor and it remained the same after the policy intervention (Australian Government, 2014a). Despite the different contexts of each region, the GBR regions were subject to the same water quality targets established by the *2009 Reef Plan* in terms of pollutant reductions. It seems, therefore, that the water policy considered the GBR as one region but, at the same time, delivered the policy through six different NRM regions created for the purpose of being more effective at the environmental service delivery.

Furthermore, the state and federal governments recognised the relative ineffectiveness of the regional approach to deliver the *2009 Reef Plan* by stating that "while there is considerable funding for the protection of the Great Barrier Reef, it is modest relative to the size of the water quality problem" (Australian Government, 2014b, p. 10). Interviewee AS1 commented, in this regard, that the prioritisation in the allocation of funds was inappropriate, and the distribution of the financial resources could have been better. Subsequently, new plans were developed to improve the water quality condition, the *2013 Reef Plan* (Australian and Queensland Governments, 2013) and the *Reef 2050 Long-Term Sustainability Plan* (Australian Government, 2015b). However, the role of collaborative governance in achieving the water quality outcomes of these planning efforts has not yet been explored. As previously stated, this study focuses on the *2009 Reef Plan* and its main implementation strategy, *Reef Rescue.* The next subsection explores the impact of the collaborative approaches of each region on the water quality outcomes based on the proxy variable of the coordinators. This exploration is complemented with comments by the stakeholders interviewed.

6.3.3.2 Impact of regional collaborative governance

In this section, I analyse in more detail the potential relationship between collaborative governance and environmental outcomes, based on the key coordinator variable to differentiate between the regional collaborative approaches. This analysis offers an explanation of how the different collaborative governance approaches in the NRM regions might have influenced the water quality outcomes achieved by each region. It is important to note that regions with more funding for on-ground delivery did not necessarily achieved the best water quality outcomes. The different water quality outcomes obtained may be explained through their regional collaborative approaches. The views from the interviewees complement the analysis of how the regions' collaborative efforts impacted on the environmental outcomes.

Each of the six NRM groups included in this study was responsible for the delivery of the *2009 Reef Plan* in their NRM regions. They were devolved this responsibility by the federal government. The key factor that enabled their collaborative approaches was funding. Moreover, stakeholders from the NRM regions considered that without the incentives provided by *Reef Rescue,* collaboration would have been marginal. As shown in Figure 6.10, each NRM region received different amounts of funding through allocation decisions made solely by the federal government. It is important to note that the stakeholders did not participate (e.g. through deliberation) in the decisions about funding allocation in *Reef Rescue*.

One of the key characteristics of the *2009 Reef Plan* is that the policy represents an example of a collaborative governance approach that was informed by robust scientific evidence about the impacts of land based run-off on water quality. It was an evidence-based policy that provided a strong argument about the importance of addressing the water quality problem (Queensland Government, 2008). However, the stakeholders from the regional NRM bodies and agriculture industry representatives questioned the data on the water quality outcomes. Particularly, the four interviewees from the agriculture sector (AI1, AI2, AI3, and AI4) argued that the modelling program behind that data does not provide fully accurate measures of their efforts at reducing land-based runoff.

These agricultural stakeholders considered that the scientific information is insufficient and only accounts for a general aspect of the issue. Moreover, they complained about

the lack of evidence on the impacts of water quality from individual farms. In their view, the policy problem of water quality is not a serious issue. It became significant due to politics and international pressure from international organisations such as the United Nations World Heritage Committee. Hence, the water quality outcomes are overshadowed by the uncertainty that surrounds the actual impacts. For these reasons, the agricultural stakeholders, as well as most of those from the regional NRM bodies, tend to disregard the data about the water quality outcomes shown in Tables 6.3, 6.5 and 6.7.

Stakeholders from the regional NRM bodies and agriculture industry representatives also tend to discount the reporting method followed by the state and federal governments regarding the overall water quality condition. They consider that the ratings between poor-moderate-good-very good water quality conditions from the modelling program (Queensland Government, 2014) represent a simplistic way of evaluating their regional efforts. However, each region had their own method of collecting and reporting on the data about pollutant reductions. The uncertainty, in this analysis, is also generated by the different regional reporting standards developed by the NRM bodies. It is worth noting that, overall, the effectiveness of collaboration seemed moderate as the achievements on water quality fell short of the original targets of the *2009 Reef Plan*. In addition, as stated previously, the official view considered that the investment towards the policy issue was modest.

To test the assumption that the regional collaborative approaches might explain why one NRM region achieved better water quality outcomes than the others (despite having less funding for on-ground delivery), the study focused on the governance structures of the regional NRM bodies, based on the typology of NRM regions. As mentioned before, in general the regional NRM bodies are non-statutory and non-profit organisations with similar governance structures, composed of two main elements: 1) community-based board of directors; and 2) a management branch led by a CEO. Nonetheless, between these elements there are differences amongst the regional NRM bodies. These include the composition of the board of directors as well as the number of directors; the number of staff that worked in the organisations during the period of *Reef Rescue* and the *2009 Reef Plan* (2008-2013); the presence of a profit branch (e.g. commercial enterprises); and the funding received as part of *Reef Rescue.*

This study added to these governance characteristics the ranking of NRM regions

developed by Robins and Dovers (2007a), which ranked the total 56 NRM regional bodies in Australia at the time of the NHT Extension program and NAP of 2001.The ranking was based on the capacity of the regional NRM bodies to meet planning and management responsibilities. This ranking allows identifying the initial overall capacity of the regional NRM groups in the GBR catchment. Table 6.8 shows in more detail the elements of the NRM bodies' governance structures.

Table 6.8 Governance structure elements of the regional NRM bodies of the GBR catchment.

NRM group	Board composition	Board numbers (2008-2013)	Staff numbers (2008-2013)	Profit branch	Capacity ranking (1=highest; 10=lowest)	Funding (AUS million)
Big/Dry/Graze						
NQ Dry Tropics	Skilled	9	20	No	3	32.4
FBA	Mixed	14	30	Yes	3	30.6
Small/Tropical/Sugar						
Reef Catchments	Mixed	7	30	No	8	32.0
Terrain NRM	Skilled	10	38	Yes	7	33.0
Medium/Tropical/Mild						
BMRG	Representative	10	30	No	4	16.3
Cape York Sustainable Futures/ Cape York NRM	Representative	10	15	No	9	4.1

The board composition in Table 6.8 is classified as representative, skilled and mixed. Representative means that the members of the board are members of different sectors selected to be represented in the governance structure of the NRM bodies. They are either invited by other members of the NRM group or elected by the community. Examples of such sectors include the scientific community, traditional owners, local government, primary/secondary/tertiary industry sectors, community catchment and community conservation. Skilled refers to members selected according to their professional skills (e.g. financials, governance or community relationships) as in the style of a private company that hires people based on their acquired skills. Mixed refers to a combination of representative and skilled members of the board. A common criticism of the board's composition is that the representative type of member makes it hard for those representatives of sectors to take off their 'representative hats' and have a real sense of belonging to the NRM body. The skilled type of members are disconnected from the community as they were not appointed by it. A mixed-composed board would deal with both issues. So far, there are no studies that explore the benefits or setbacks of each board type in the NRM bodies. This research gap is out of the scope

of this research project.

Regarding the profit branch element of the governance structures in Table 6.8, only two of the NRM bodies have one; FBA and TNRM. Profit branches refer to commercial business created by the NRM organisations, additional to their activities as a non-profit organisation, designed to complement their income sources. Usually, they are environmental consultancy businesses, and they have been established to supplement the limited funds provided by federal and state governments. Engaging in business activities though, contradicts their non-profit nature.

The total number of board directors as well as staff gives an idea of the size of the regional organisation. In general, these numbers show that the NRM bodies in the GBR are small organisations with fewer than 50 staff members. On average, the six NRM bodies have 27 staff members. The largest is Terrain NRM with 38 total staff, while the smallest is CY with 15 total staff. Comparing the total staff number of each category of the typology with the water quality outcomes achieved, there does not seem to be a positive association between having more staff and achieving better water quality outcomes. On the contrary, there are mixed results. Figure 6.11 shows this in more detail.

Total staff per category vs water quality outcomes
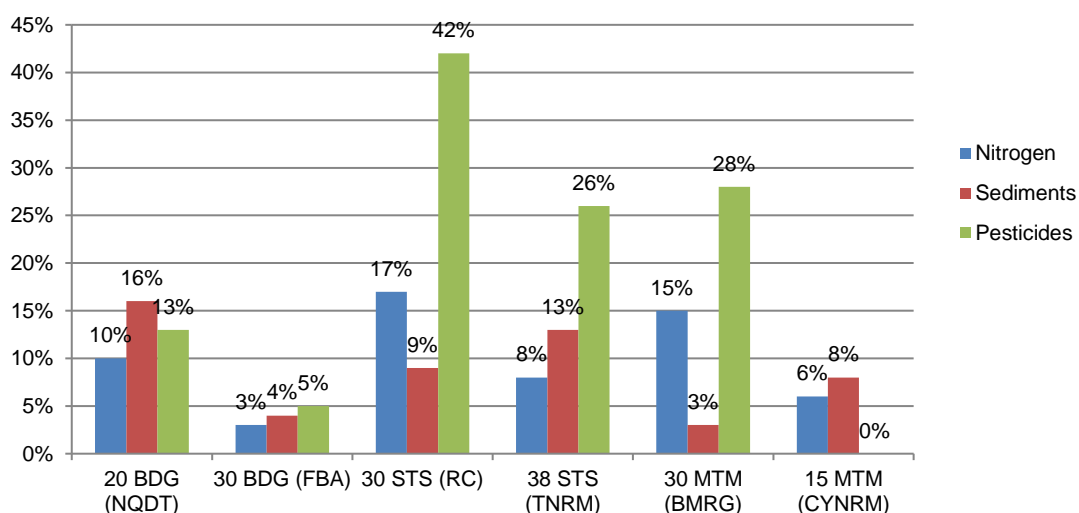
Figure 6.11 Total staff of each NRM body vs water quality outcomes achieved by the *2009 Reef Plan*.

For instance, TNRM was the region with the highest number of staff, but did not achieve the best water quality outcomes in any of the pollutants targeted. CYNRM had the lowest number of staff members and achieved better water quality outcomes than FBA, which had 30 people. BMRG and RC belong to different categories of the typology; the first is part of the MTM region, while the latter is located within the STS regions. Both achieved a similar outcome in terms of nitrogen reductions (15% and 17% reduction, respectively), and had the same number of staff: 30 people. Additionally, NQDT was the second region with the lowest number of staff (20 people); however, it achieved the best outcome in sediment reductions (16% reduction). While FBA was also part of the second largest organisations with 30 staff members and achieved the lowest pollutant reductions of the six NRM regions. In other words, linking the total staff of each organisation with the water quality outcomes achieved during the *2009 Reef Plan* does not show any positive association, such as the largest NRM bodies achieving the best water quality outcomes, and the smallest ones achieving the worst.

Something similar occurs in the relationship between the water quality outcomes achieved and the capacity ranking of each NRM group. This capacity ranking classification was developed by Robins and Dovers (2007a), and provides a measure to compare the capacity of each NRM body to plan and manage natural resources, in this case water. The classification refers to the NRM regions, not the NRM groups. However, as these regions are managed by the NRM groups, it represents so far the only attempt at developing a classification of each regional NRM group's planning and management abilities.

For example, a classification of 3 (out of a possible 10), which is the highest received by two NRM regions included in this study, Burdekin and Fitzroy, means that these regions have high access to resources (e.g. research provided by universities) and services (e.g. infrastructure); moderate populations and were ranked as priority regions under the NAP. A classification of 4 like Burnett Mary enlists fewer resources available (e.g. universities and research centres); smaller populations; but good access to financial resources. Regions classed as 7, such as Wet Tropics (T NRM), have a high number of research centres; but small areas; as well as low potential access to resources. Being classed as 8 refer to lower access to learning and technical support;

moderate to high populations in relatively small areas; and good access to services. This is the case of Mackay Whitsundays managed by Reef Catchments. Finally, a classification of 9 involves having no universities or research centres; a reasonable access to services; small population and varied regional area sizes, which is the case of Cape York. As with the case of total staff numbers, there is no positive association between the capacity ranking of the NRM regions and their achievement of water quality outcomes. See Figure 6.12 for more detail.

Rank per region vs water quality outcomes
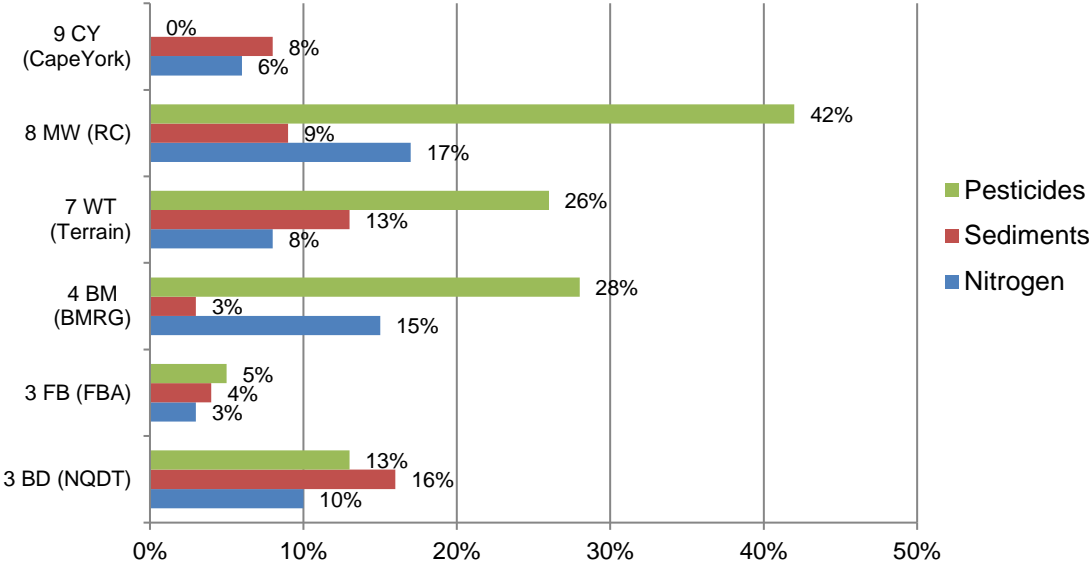
Figure 6.12 Capacity rank per region (1=highest capacity; 10=lowest capacity) vs water quality outcomes achieved by the *2009 Reef Plan*. In this case, the information is not classified using the typology of NRM regions.

Moreover, Mackay Whitsundays, one of the regions ranked amongst the lowest in capacity in Table 6.8 (ranking of 8) and part of the STS regions, achieved the best water quality outcomes in pesticides and nitrogen. Fitzroy Basin and Burdekin, part of the BDG regions, were classed highest (3) among the NRM bodies in the GBR. Yet Fitzroy achieved the lowest pollutant reductions and Burdekin (managed by NQDT) had the best water quality outcome of sediment reductions. BMRG, for their part, achieved the second best water quality outcomes in terms of nitrogen and pesticides and the Burnett Mary region (part of the MTM category) had also the second best capacity ranking of 4. CY did not achieve the worst water quality outcomes, despite that the Cape York region (part of the MTM category) was ranked with the lowest capacity of 9.

Furthermore, the capacity ranking reinforces the absence of a positive association between total staff and water quality outcomes achieved. One could expect, for example, that the largest organisations, such as TNRM, would also belong to the regions with higher capacity, but this is not the case, as the Wet Tropics (which manages Terrain) has a capacity rank of 7, closer to the lowest ones. NQDT and FBA are smaller than Terrain NRM and their regions (Burdekin and Fitzroy, respectively) were the highest ranked organisations of the GBR classed as 3. In analysing total staff and capacity vs water quality outcomes achieved, there are mixed results. Hence, there is no positive relationship between the capacity of each NRM body and the water quality outcomes achieved. The results vary as with the total staff and water quality outcomes relationship.

None of the elements of the governance structures discussed (Table 6.8) of the NRM groups allow identifying the impact of their regional collaborative governance approaches. Rather, they refer to the groups' composition, such as the board's composition or total staff, or to their measured capacity, elements or aspects that do not contribute to differentiate between the formal collaboration that each NRM group followed during the *2009 Reef Plan*. In general, there does not appear to be any element or indicator that could represent the regional collaborative governance approaches. It was discussed in Section 6.3.2 that the regional collaboration was essential to implement the *2009 Reef Plan* and that this collaboration occurred by the partnership relations of three actors: the NRM groups, landholders and regional agriculture industry organisations. The differences among this depiction of regional collaboration occurred in the manner that these actors interacted, which is not captured by any of the elements of the governance structures shown in Table 6.8. Moreover, these interactions follow mostly informal patterns that are not registered in any official or research account.

However, for this study, there is one element of the governance structures that distinguished the collaborative governance approaches: the existence of coordinators among them. The role of the coordinators was to engage with the landholders to support them in their adoption of better land management practices. Improved land management practices would reduce the pollutant loads into the GBR and thus, improve the quality of water. In this sense, coordinators serve as a proxy indicator to differentiate between the collaborative approaches of the NRM groups. They represent a tangible element of collaboration that can be analysed in order to explore the impact of regional

collaboration on the water quality outcomes achieved by the *2009 Reef Plan*. Coordinators were identified as extension or land management officers by the NRM bodies and their role was to facilitate landholders' decisions regarding the adopting of improved land management practices. In this regard, they played a key collaborative role by engaging landholders to adopt voluntarily changes in their land management practices. In some cases, coordinators were appointed directly by the NRM groups: others they were sub-contracted through an agriculture business company. Apart from providing a hint on the different regional collaborative approaches of the NRM groups, the existence of coordinators also offer a potential explanation to why some NRM groups achieved better water quality outcomes despite having less funds available. Alternatively, it may help explain why some NRM bodies achieved worst water quality outcomes even if they had more funding available for on-ground delivery.

The comparison of the regional collaborative governance approaches is presented without using the typology of NRM regions developed previously, as it shows more directly the likely impact of proxy indicator on the six NRM regions. The typology is used afterwards to complement the explanation around the implications of the impact of collaboration on the water quality outcomes, in order to offer a contextual explanation to the coordinators proxy variable. Figure 6.13 below shows that there is a positive tendency between having four or more coordinators and achieving better water quality outcomes.[5]

For example, BMRG, CY, FBA RC and TNRM had coordinators available during the *2009 Reef Plan* (either appointed directly or sub-contracted). However, FBA and CY had four or less coordinators and achieved worst water quality outcomes than the three other regions that had from four to seven coordinators. NQDT had no direct coordinator role in its organisational scheme. Coordinators were part of a complex management scheme in which other organisations performed that role. Hence, their contribution is not clear. BMRG had seven coordinators appointed directly by the organisation, which were identified as extension officers, in the period of *Reef Rescue* implementation (2008-2013). The NRM region achieved better water quality outcomes in nitrogen and pesticides than other three NRM bodies — FBA, NQDT and TNRM — despite having

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[5] The information about the number of coordinators available during the implementation of the plan was provided by interviewees from the regional NRM bodies. It is important to note that this information was separate from the semi-structured interviews.

considerably less funding for on-ground delivery available.

Total coordinators vs water quality outcomes
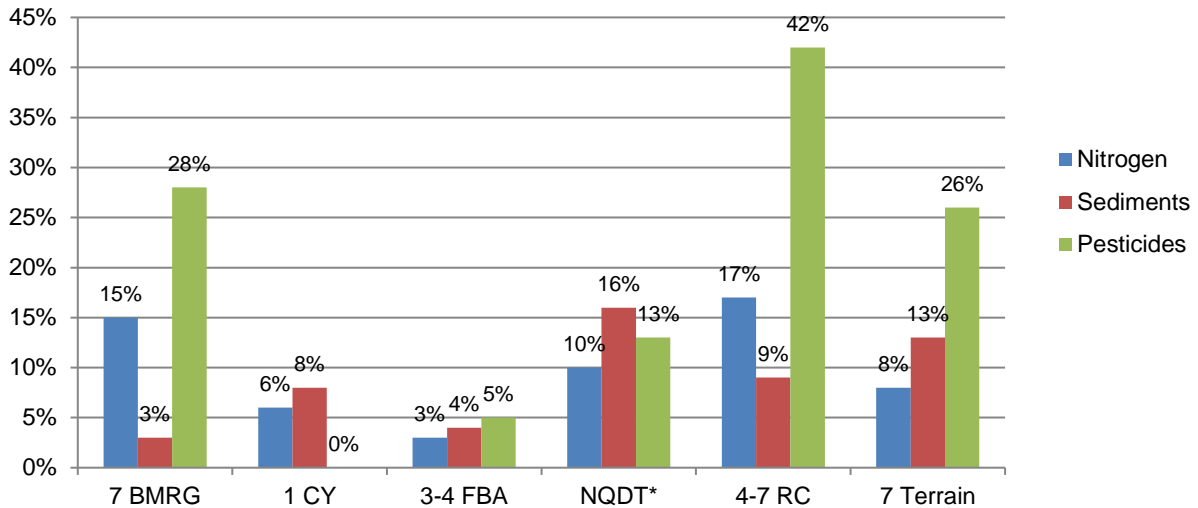
Figure 6.13 Total numbers of coordinators per NRM group vs water quality outcomes achieved by the 2009 Reef Plan (information is not classified using the typology of NRM regions). *NQDT had no direct facilitator role within its organisation as there were other organisations involved in this role.

It is interesting to see that the Wet Tropics, managed by Terrain NRM, had more than double the funds of BMRG (33 vs 16.3 million) and achieved very similar outcomes than BMRG in terms of nitrogen and pesticides reductions. Terrain NRM had also seven coordinators or extension officers sub-contracted through an agriculture business during *Reef Rescue*. The region achieved a better outcome for sediment reductions than BMRG.

The variety in the numbers of coordinator or facilitator roles offered by some of the NRM groups, such as Reef Catchments or Fitzroy Basin, indicate the changing priorities of land management year-to-year, according to the agriculture sectors impacting water quality: grazing, sugarcane, and horticulture. RC had between four and seven coordinators also sub-contracted to a private agriculture business during the five year period of the policy, and the Mackay Whitsundays region achieved the best water quality outcomes in pesticides and nitrogen, while also receiving one of the highest amounts of funding (A$32 million). Interestingly, RC had fewer coordinators than BMRG and achieved better water quality outcomes; however, it had more than double of funds

available (as in the case with TNRM). RC also achieved better water quality outcomes than TNRM with similar number of coordinators and slightly less funding.

FBA had between three and four coordinators for the Fitzroy region and it achieved the lowest pollutant reductions in the six NRM regions, despite being among the top-funded regions, with 30.6 million available for on-ground delivery. This could suggest that having fewer coordinators relates to achieving less pollutant reductions; however, due to the reduced data, it was not possible to develop a regression analysis between coordinators and water quality outcomes variables. Hence, there is no linear relationship between these variables that would allow affirming that having more coordinators associates with achieving better water quality outcomes.

On the other hand, NQDT achieved the best outcome in terms of sediment reductions, but it is not clear if they had coordinators available to support the delivery of the *2009 Reef Plan*. CY was the region with less funding available, and achieved a similar outcome in sediment reductions than RC (8% and 9%, respectively), one of the top-funded regions. CY had one coordinator available. Briefly, this analysis shows that the existence of four or more coordinators in an NRM body tends to contribute with the achievement of better water quality outcomes, regardless of being appointed directly or sub-contracted through an agriculture business.

Another aspect to consider in the analysis is the sub-contracting of the coordinators' role, which does not represent a collaborative governance practice, but rather a business approach that is related to market governance. In this sense, it represents an example of how collaborative governance in Queensland natural resource management interacts with other governance approaches to attain its goals. Nonetheless, stronger regional collaborative approaches indicated by the existence of more coordinators (regardless of the nature of their appointment) seemed to contribute positively in achieving better water quality outcomes despite the funding received for on-ground delivery. On the other hand, the coordinators proxy variable contributes by reducing the uncertainty that prevails on the relationship between collaborative governance and environmental outcomes. Figure 6.14 below shows the relationship between regional collaborative approaches and environmental outcomes, based on an adaptation of the Process-Outcomes governance framework.
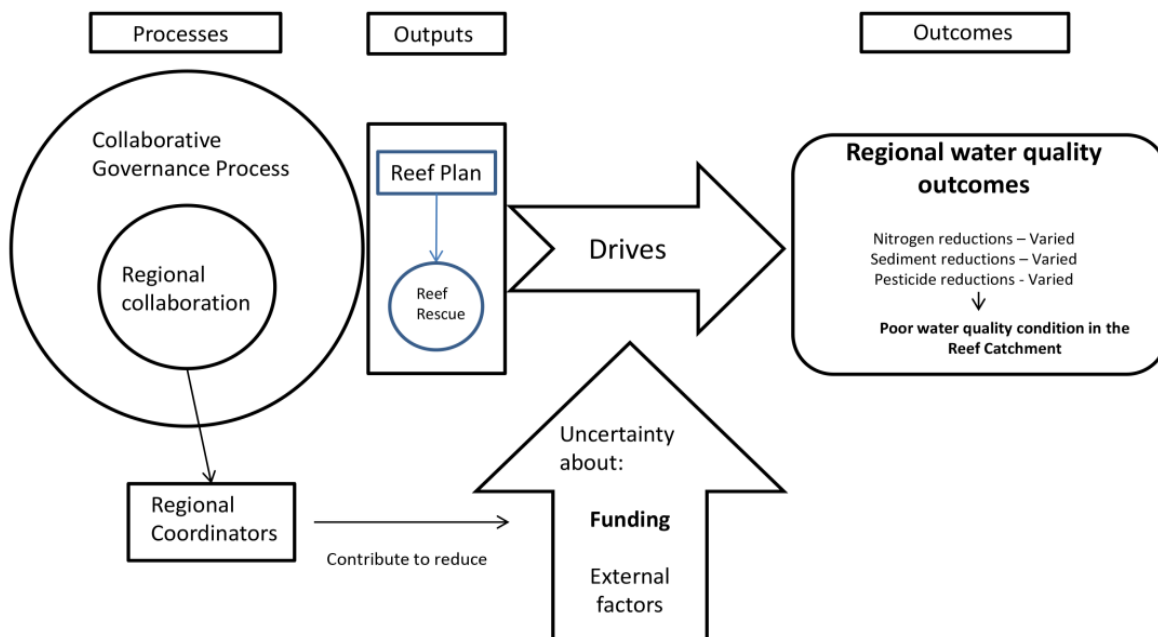
Adapted from Rauschmayer et al., 2009

Figure 6.14 Adapted Process-Outcomes governance framework, focused at the regional scale of collaboration. The proxy variable of regional coordinators serves to reduce the uncertainty on the relationship between collaborative governance and environmental outcomes.

In order to provide a better understanding, the analysis about the impact of regional collaboration on water quality outcomes through the coordinator variable is complemented by a set of external factors identified by the interviewees from the six regional NRM bodies. In general, these regional stakeholders considered that the NRM regions would have been able to achieve larger pollutant reductions with more funding for on-ground delivery. However, when asked about why in some cases this was contradicted during *Reef Rescue* — such as a region achieving better outcomes despite having less funding — there were two types of explanations offered: 1) approaches to collaboration that facilitated more effective implementation; and 2) external factors.

Table 6.9 divides both explanations between their main features. In the first explanation, the appointment of coordinators to support regional collaboration during *2009 Reef Plan* was suggested by the interviewees as having a positive impact on the achievement of better water quality outcomes. This view is based on perceptions from the stakeholders,

rather than on evidence provided by them. The agreement between the results of the coordinator proxy variable analysis and stakeholders' perceptions suggest undertaking more focused research on the impact of collaboration through the use of coordinators once the present plans (e.g. the *2015 Reef Plan*) are implemented. It should be noted, as well, that the interviewees from the regional NRM bodies were reluctant to discuss in detail about potential comparisons between them. The majority of them said that they were unaware of the funding amounts received by other regions.

Table 6.9 Factors that contribute in explaining different achievements on regional water quality outcomes.

Regional collaboration	Higher levels of cohesion between the stakeholders Specific engagement roles (e.g. coordinators) Informal regional collaboration
External factors	Staff skills (e.g. technical knowledge) Weather events (e.g. cyclones or floods) Land size and land-use of each region Market shifts (e.g. price changes) Data standards Time-frame of the water quality plan

The role (and potential influence) of the external factors is essential to complement the analysis about the impact of regional collaborative governance on water quality outcomes (following Figure 6.14). For instance, Burnett Mary's highest reduction in nitrogen could be partially explained by market shifts, such as the price of production inputs. Interviewee RB5 pointed out that the nitrogen and pesticide reductions ones might have also been consequence of a change in the price of fertilisers. In 2009, the price of fertiliser more than doubled from previous years due to the increases in fuel prices, which made the farmers reduce their use or employ it more efficiently by putting it underneath the ground. Interviewee RB12 explained that the change in the price of fertiliser was coupled with a reduction in world sugar prices in the first couple of years of *Reef Rescue*.

In terms of the approach to regional collaboration, interviewee RB4 explained that the trust that developed through the informal relationships between the NRM group, the industry representatives and the landholders could have contributed to higher rates of change in management practices. This might also explain why before the implementation of the *2009 Reef Plan*, there were already different land practices in place from sugarcane. For example, some farmers built dams to stop the run-off and use the water contained in them for irrigation. So part of the achievements in nitrogen

could have reflected the sugarcane practices of previous years.

Another important external factor was the data standards followed by each NRM group. Each of them adopted different ways of reporting changes in land management practices and reductions in the three pollutants. As a consequence, the data standards across the regions in the GBR were inconsistent and this might also explain why some regions achieved better water quality outcomes. In other words, the way of collecting data and reporting it by each NRM group to the *Paddock to Reef* modelling program (which presented the results of the *2009 Reef Plan*), might partially account for the differences in the water quality outcomes achieved. In this regard, interviewee RB12 stated that there were different levels of rigour in the methodologies followed to report the pollutant reductions and there might have been over-reporting in some regions (no specific region was identified by the interviewee). The inconsistency of data standards across the regions is summarised in this comment from interviewee RB9:

> "I would take those numbers (the water quality outcomes of Tables 6.3, 6.5 and 6.7), not with a grain of salt, but I would be very cautious about relating them back to level of investment or the quality of governance."

In terms of regional collaboration, interviewee RB9 added that, through better coordination and cohesion, it is highly probable that better water quality outcomes would have been achieved. This view was reinforced by interviewee RB12, who considered that the issue was not about having more funding available for on-ground delivery, but about better integration within the collaborative approach:

> "The only thing we didn't do well was integrate: was get collaboration between Queensland Government and Australian Government."

This stakeholder added that there was enough funding for the water quality plan and the water quality outcomes achieved through collaboration, compared with previous water planning efforts, did make a significant difference for the GBR catchment.

Interviewees RB6 and RB7 explained that the figures on water quality outcomes, particularly the sediment reductions, were not comparable as the land areas of some regions were significantly bigger. The land area external factor links with the typology of NRM regions. For instance, the land area explains the low achievements in water quality of the Fitzroy region, which is the largest NRM region in the GBR. It is about three times

the size of the Mackay Whitsundays, which achieved the best water quality outcomes in nitrogen and pesticides. For this reason, the pollutant reductions in larger areas were less likely to be visible than in smaller regions, such as Burnett Mary or the Wet Tropics. Following this logic, these regions should have received more funding for on-ground delivery: a funding amount that matched its land area.

In addition, interviewee RB6 argued that the implementation efforts were strongly impacted by weather events that occurred in the Fitzroy region, such as cyclones and floods. However, the weather events also affected other NRM regions analysed during the implementation of the *2009 Reef Plan*. Therefore, they were subject to the same climate unpredictability, which they highlighted as factors that affected the implementation of the program in their respective individual reports on Reef Rescue Achievements (BMRG, n.d.; FBA, n.d.; and TNRM, n.d.). A likely consequence of the regional collaborative approach, though, was that by the end of the policy, around 2013, there were more landholders willing to change than incentives available. As a regional actor briefly explained:

"In 2008 we begged people to take projects; in 2013 we were turning people away" (RB6).

Apart from collaboration supported by adequate funding, interviewee RB2 considered that staff skills and a longer time-frame for the plan would have contributed to better water quality outcomes of the *2009 Reef Plan*. Staff skills refer mainly to the ability of managers to identify the areas or 'hotspots' in a region that have the greatest impact on the GBR's catchment, and prioritise the actions to address the water quality issues in those areas. That would render higher achievements in pollutant reductions. So far, the ability to identify regional 'hotspots' has been absent in the water quality plans. In addition, the complex nature of the water quality issue, as RB3 explained, requires longer time-frames to demonstrate change in the water quality conditions. Thus, instead of a five year period allocated to *Reef Rescue*, it would be better to design a plan with 10 or 20 year time-frames. The recent Reef Plan addresses this time-frame factor by planning water quality targets on a 35-year time horizon (Australian Government, 2015b).

Interviewee RB8 said that the water quality outcomes were reflective of the land-uses in each region. This external factor also links with the typology of NRM regions. For instance, a region that is devoted mainly to grazing, such as those in the BDG category,

would get a larger outcome on sediment reductions. This is true for the case of Burdekin, which achieved the highest sediment reductions, but not of Fitzroy. Moreover, the Wet Tropics, despite being a region from the STS category focused largely on sugar cane farming, achieved the second highest sediment reductions, as Figure 6.8 shows.

Interviewees RB8 and RB10 argued that more funding for on-ground delivery would not have made a difference as the outcomes would probably have remained the same. First, the engagement of landholders was voluntary and, therefore, there was a limit on land practice change. Secondly, they considered that doubling the amount of funding would not have doubled the achievements on water quality outcomes. This logic is based on the 80-20 rule of investment, in which the investor receives 80% of the investment return with 20% of the effort. Continuing the effort leads only to marginal increases of the investment return. On the other hand, the interviewees accepted (without offering details) that some regions that received less funding might have been upset. This probably explains the limited cross-regional collaboration during *Reef Rescue*.

Interviewees from the 'high collaboration' sphere (federal and state governments, as well as agriculture industry representatives coded in Table 6.1) also offered views on why more reductions in pollutants were achieved in some cases by regions with less funding. However, they were careful to not identify a particular region or engage in comparisons. For instance, interviewee AI2 explained that better outcomes with fewer funds available might have been the result of having an extension officer on the ground that focused on engaging the landholders in its region to participate in *Reef Rescue*. As mentioned previously, extension officers were another name for the coordinators' role. This view supports the finding of the positive association between coordinators in place in a given NRM region and achievement of better water quality outcomes. Interviewee SG3 considered that rather than levels of funding received, the results reflected the levels of cohesion between the stakeholders of a region. At certain times, the interviewee added, that some regions had quite fractured relationships between the stakeholders, leading them to less effectiveness in the implementation of the policy.

Interviewee SG2 argued that the key factor explaining the impact of funding were the staff skills in the regions. In this case, the regions with more qualified people would have been able to achieve more. These skills, such as technical knowledge, fit with the view from interviewee FG1, who explained that this type of skills allowed a more appropriate prioritisation and project selection towards the areas with more impact. To

support this view, the interviewee said that 95% of the water quality outcomes were caused by 50% of the land management projects (this represented a more specific example of the 80-20 investment rule). This shows the partial efficiency of the policy. Rather than more funding, improvements in the project selection would have led to better outcomes. The staff skills could also have been involved in the ability of each region to collect data and report it to the *Paddock to Reef* program. In consequence, staff able to use more comprehensive methods of data collection could have influenced a higher estimate of pollutant reductions for a given region.

While it is clear that stronger forms of collaboration, as indicated by the role of coordinators, might have facilitated effective implementation, it cannot be ignored that the impact of the external factors to the regional collaborative approaches could have been more significant, such as staff skills or market shifts. In this case, collaborative governance seems partially responsible for the outcomes achieved by the water quality plan as it can be viewed as the motor that sustained the machinery of the planning effort. However, the different regional water quality outcomes achieved seem to respond more to the external factors identified by the stakeholders interviewed.

On the other hand, there is no clear evidence of how the relationship between the impact on water quality (pollutant loads) shown in Tables 6.3, 6.5 and 6.7, and reduction of pollutants. For instance, whether it is more difficult to show a reduction when the contribution of pollutant loads is higher (as in the case of Wet Tropics with nitrogen or Burdekin with sediments) or, on the contrary, higher reductions are obtained in the regions with the smallest impacts on water quality, such as Burnett Mary with nitrogen or Cape York with sediments. This relationship requires more investigation but is out of the scope of this study.

6.4 Discussion and conclusion

The impact of different regional collaborative governance approaches to the water quality environmental outcome in Queensland natural resource planning was analysed through a case study analysis of the GBR that was based on document reviews as well as interviews with the key stakeholders of the plan evaluated. Regarding our first research question about the role of collaboration in the implementation of *2009 Reef Plan*, I found that there was a consensus between the stakeholders' perspectives on

the fact that collaborating was essential to achieve the water quality outcomes, even though it had a limited nature and, in general, it was viewed as a working relationship rather than as a process of deliberation and consensus-building between the stakeholders.

Reconsidering Ansell and Gash's (2008) definition on collaborative governance, regional collaboration in *Reef Rescue* had a limited scope, and was not seeking deliberation or consensus-based decisions between the parties. Limited or narrow collaboration is used as a technique to facilitate cooperation, rather than a broader approach, in which collaboration deepens participation and deliberation in public affairs and, thus, enhances democratic consent (Ansell, 2012). This limited collaboration was motivated by devolution of responsibility for delivery from the federal to the regional level, on the assumption that this level of governance was best suited to implement the policy (Kroon et al., 2016). From the perspective of water quality outcomes achieved by the water quality plan, it can be said that collaboration made possible the implementation of the plan but was moderately effective in improving the water quality conditions, as the overall water quality condition of the GBR remained poor after the governance intervention.

The study also found that collaboration interacted with top-down processes of governance at higher levels of government, such as the federal and state levels. As a consequence of this interaction, collaboration was counterpointed by regulations introduced by the state level. In this regard, the limited nature of collaboration was constrained by higher (and more powerful) levels of government, which directed the policy, despite that the official documents emphasise the collaborative approach as a successful example that should be continued by further policies (Australian Government, 2011). Further, in the stakeholder views included in this research, collaboration occurred in combination with top-down governance strategies, resembling a mixed governance approach used as a tool to solve a policy problem.

The type of collaboration perceived by the stakeholders during the *2009 Reef Plan* represents an example of the account of Scott and Thomas (2017) of collaborative governance as a 'toolbox' used to solve public problems. Moreover, the mix between collaboration, through incentives and more top-down mechanisms such as regulations, fits with the conceptualisation of collaborative governance offered by Scott and Thomas (2017). In their view, collaborative approaches are characterised by a variety of tools,

such as participation incentives, formal agreements, rules and deliberative forums that support collaborative governance "as a means to an end" (p.3). Within the collaborative governance arrangements of *2009 Reef Plan*, I found that the main role of collaboration was to develop working relationships (either formal or informal) at the regional level, between the NRM groups and the regional agriculture industry to promote practice change among the landholders. Collaboration had a key but limited role, which contradicts the official view that presents *2009 Reef Plan* and its *Reef Rescue* strategy as a landmark of collaborative efforts (Australian Government, 2014a).

Regarding the second research question, about the impact of the regional collaborative approaches on the water quality outcomes, I focused on key elements of the governance structures of the NRM bodies — mainly, the existence of coordinators as a proxy for collaboration. I found that, despite funding amounts allocated for on-ground delivery, the appointment of more than one coordinator to promote land management practice change among the landholders had a positive contribution on water quality outcomes achieved. The analysis of the coordinators proxy variable suggest that stronger collaboration (noted by more coordinators in place to engage with landholders) contributed to achieving better water quality outcomes. It was also suggested by the stakeholders interviewed that relying on extension officers renders a stronger collaborative governance approach, which would likely lead to better water quality outcomes.

The positive contribution of coordinators in achieving improved outcomes is supported by Conrad (2015). In her study about regional water planning in California, she also found a positive impact of coordinators ('network managers'). For instance, the Californian regions with coordinators available had stronger collaboration and, as a consequence, better performance in the management of water quality issues. Ansell (2015) found something similar in a public health study. He examined three global public health initiatives that relied on collaboration, such as AIDS, tuberculosis and malaria. In his study, he found that collaboration was stronger in the initiatives as they had coordinators. Moreover, coordinators improved the delivery of these public health programs by linking the efforts at the global and state levels.

The study was able test the relationship between coordinators per NRM group and water quality outcomes by reviewing past organisational structures of the regional NRM bodies and asking participants of the regional NRM sector about the appointment and

number of devoted to coordinator roles. The positive tendency between coordinators and water quality outcomes achieved could also indicate the development of trust at the regional collaborative approach. Trust is an important benefit of collaboration that could represent an intermediate outcome that led to the water quality outcomes. However, some of the coordinator positions were sub-contracted, which represent a business relationship where trust is not important to deliver a service. The sub-contracting strategy also shows the interaction of collaborative governance with market approaches (apart from top-down ones) to govern the delivery of environmental outcomes. Rather than representing a contradiction to collaboration, sub-contracting might be located within the collaborative governance 'toolbox' of Scott and Thomas (2017) design for problem-solving.

Furthermore, although the findings on the coordinators' impact might suggest that more funding should be allocated for this position, it stands as a partial explanation for the impact of collaboration. Other variables mentioned by the stakeholders interviewed to test the impact of collaboration were the informal relationships developed between the regional actors as well as the levels of cohesion between the regional stakeholders. For these variables, it would be appropriate to develop proxy variables in further studies. For example, examining informal relationships and levels of cohesion would imply relying on a different evaluation framework that involves network analysis, and a different governance definition that includes informal collaboration in its governance conceptualisation. Hence, this remains an area for further research.

Regulations were mentioned as having a role in the water quality outcomes achieved by only one of the stakeholders interviewed. The effect of regulations, however, was not identified either by the stakeholders or by the official documents. Kroon et al (2016) highlight that the state government suspended enforcing the regulations in 2012, and there were no assessments about their effectiveness.

Overall, the main contributions of this chapter are the development of the typology of NRM regions and the proposal to use a specific collaborative role (e.g. coordinators or extension officers) to deal with the difficulty in attributing the environmental outcomes to a tangible element of the collaborative governance approaches. The typology serves to contextualise the nature of the water quality problem and the different impact on water quality in each NRM region. The coordinators proxy variable contributes to address part of a gap encountered by previous research (Ulibarri, 2015). "The less proximate

outcomes are to the collaborative action or the more dependent they are on other contributing or intervening factors, the more difficult it is to attribute the specific outcomes directly to collaborative efforts" (Emerson and Nabatchi, 2015, p. 724).

In other words, the chapter puts forward a tangible variable of a rather abstract shaping factor such as collaborative governance that could reduce the uncertainty on the relationship between less proximate outcomes (e.g. environmental outcomes) and the collaborative intervention (as Figure 6.14 shows). Nonetheless, given the lack of a linear correlation between more coordinators and more percentage reductions of pollutant loads, it is only possible to suggest that the existence of extension officers might partially contribute to a better achievement of environmental outcomes, in this case the water quality conditions.

On the other hand, the water quality outcomes achieved by the *2009 Reef Plan* through *Reef Rescue* depended on six external factors that each region experienced to a different degree. Developing ways to measure these external factors is a further research area. Three of them seemed to have a closer connection to the regional water quality outcomes achieved: staff skills, data standards and market shifts. Staff skills might have contributed to develop more sophisticated data collection methods that resulted in better water quality outcomes reported. Price changes of agricultural inputs as well as products due to shifts in international demand and supply on agriculture activities (driven mainly by profit performance) would have also motivated significant changes in land management practices that led to better water quality outcomes.

Regarding the other three external factors, weather events, land area/land use and time-frame of the water quality plan, their impact seems less direct and difficult to grasp. Cyclones and floods were experienced by all the NRM regions during the five year period of the policy (2008-2013); hence, their impact appears less significant when exploring the different regional water quality outcomes, and land area/land-use as well as the time-frame of the policy remain initial conditions of the plan, which cannot be modified.

From the water quality outcomes achieved by the *2009 Reef Plan* compared with the original targets, it could be inferred that the performance of regional collaborative governance — following our approach of analysing governance based on its outcomes, as Rotberg (2014) suggests — fell short of the expectations as the outcome figures

were far from the original targets. However, the figures on the outcomes are based on estimates, which do not allow any conclusive statements about governance. Moreover, the NRM regions were subject to the same water quality targets despite their different contexts, shown by the typology of NRM regions.

Perhaps, a more effective policy would consider the contexts and, accordingly, develop targets suited to the differing regional contexts. Focusing on the different impact of regional collaborative governance, though, the main implication is to highlight that through more collaboration, rather than more funding for on-ground delivery, it is more likely that better results could have be achieved. This hints at the need to introduce governance reforms to the collaborative planning efforts. For instance, develop closer ties between the NRM groups and the regional industry bodies as well as between the NRM groups themselves.

The need for governance reform has also been presented by Brodie and Pearson (2016), who argue for the need of developing more coordinated efforts when implementing natural resource plans. In this regard, the governance modifications could include the promotion of collaborative approaches that include extension strategies to motivate the participation of landholders. The type of extension strategies or methods, though, needs more research. Governance reform of collaboration should also offer greater access to the regional stakeholders in the deliberation about the implementation decisions developed at federal and state levels of governance, such as the water quality targets and the monitoring and evaluation mechanisms. While other studies (Leach and Pelkey, 2001; Koontz and Newig, 2014) have found that funds for on-ground delivery are decisive to improve environmental outcomes, in the regions analysed in this study, funding did not have the most significant impact in the outcomes achieved. Hence, it emphasises the importance of improving the collaborative approach, regardless of the funding available.

Additionally, with similar funding or at least through a consensus-based process where all the stakeholders are involved in deciding the funding allocation, the regions might be able to collaborate closer between them during the implementation process. This could also avoid developing feelings of resentment and unfairness amongst stakeholders. This analysis, however, is limited by the reluctance of the stakeholders interviewed in providing details about implementation approaches and comparing them to other regions. For instance, the stakeholders avoided discussing thoroughly aspects

of their regional collaboration as compared with those of the other regions. This type of information is also absent from the official documents.

Additionally, the analysis of the coordinators proxy as a measure of the impact of collaborative governance needs further refinement. For instance, expand the use of this variable in more than one policy, and develop a method to include the level of skills of the coordinators. The proxy variable would deliver more certainty if it combines the number of coordinators and their skills. It would also be worth examining their effect in other collaborative environmental policies, either from Australian or international cases.

The next chapter presents the examination of the general collaborative governance approach, which includes the other levels of governance involved in *2009 Reef Plan* implementation. It highlights the strengths and weakness of collaboration as well as the tensions found within this governance approach.

CHAPTER 7: HOW GOVERNANCE PROCESSES IMPACT ON ENVIRONMENTAL OUTCOMES: A PROCESS-OUTCOME GOVERNANCE EVALUATION OF COLLABORATION IN THE GBR

7.1 Introduction

The previous chapter discussed the role of collaboration in the achievement of water quality outcomes for the Great Barrier Reef. It also analysed the impact of the NRM regional collaborative approaches on the different regional water quality outcomes achieved. The analysis of the impact of the regional collaborative approaches on the regional water quality outcomes was complemented with contextual elements of the NRM regions — such as the typology of NRM regions and governance structures of the NRM bodies — to understand how they achieved different water quality outcomes. This chapter focuses on the general evaluation of the collaborative governance effort, including not only the regional level as in the previous chapter, but also the state and federal levels that were involved in the implementation of the *2009 Reef Plan* (the 'zoom out' phase of Figure 3.3, Chapter 3). The evaluation focuses on *2009 Reef Plan* and *Reef Rescue*, the main implementation strategy of the plan, to provide an answer to the research question: *What are the strengths and weaknesses of the collaborative governance approach?*

For this purpose, the analysis relies on the governance evaluation framework selected for this study (Chapter 3). The framework includes processes and outcome-oriented approaches of governance evaluation, as it allows disaggregating the processes of collaboration to see how they impacted on the water quality outcomes achieved by the *2009 Reef Plan*. Throughout the process-outcome analysis, two main tensions were identified: 1) providing incentives for behaviour change while promoting regulations; and 2) using a collaborative approach while, simultaneously, relying on competition to achieve the outcomes. The results of the study show that collaborative governance had an overall positive impact in facilitating achievement of water quality outcomes (a similar trend found in Chapter 4). This suggests that stronger collaboration would benefit environmental planning and policy efforts, leading to better environmental outcomes. In other words, enhanced collaborative governance would more likely facilitate than hinder the achievement of environmental outcomes. However, given the uncertainty identified in the previous chapter, and highlighted by Figure 7.1, regarding the links between

governance processes, outputs and consequences (e.g. outcomes), the research recognises that enhancing collaboration would not automatically lead to improved environmental results. This means that there is no causal relationship between governance processes, outputs and consequences (which cover the water quality outcomes studied in this thesis). Other variables such as the external factors identified in Chapter 6 (staff skills, market shifts, land area and weather events) have to be taken into account, as they also have an influence on the outcomes.
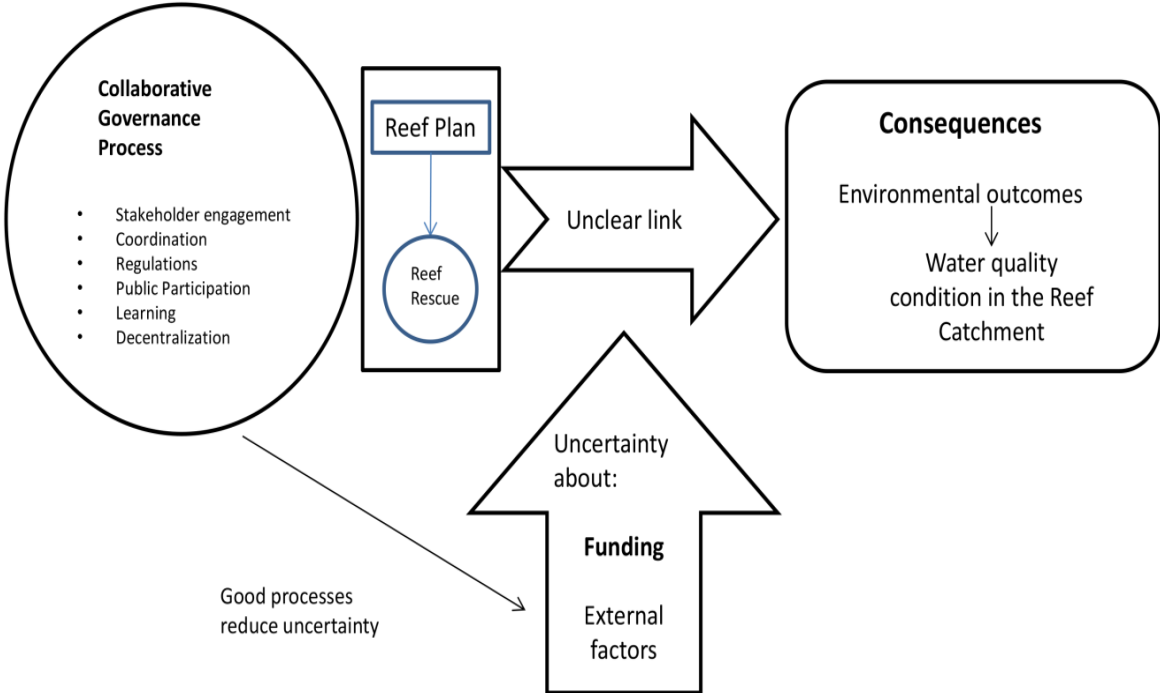
Figure 7.1 Evaluation of the governance process in the implementation of *2009 Reef Plan* (adapted from Rauschmayer et al., 2009).

It is important to present briefly what is understood by each of the processes of the collaborative governance process criteria (the large circle in Figure 7.1). For this reason, I present a table that includes each process criteria with an explanation of the concept based on the literature. Table 7.1 shows the concepts of the governance process criteria and their explanation.

Table 7.1 Brief review of the collaborative governance processes

Stakeholder engagement	Defined as the "process where individuals, groups and organisations choose to take an active role in making decisions that affect them" (Reed, 2008, p. 2418). Including all the key stakeholders, particularly from non-state sectors, is a key feature of collaborative governance, according to Ansell and Gash (2008). Generally, stakeholder engagement is assumed to lead to more legitimate governance processes that render a sense of ownership to the parties involved. This sense of ownership is what motivates the stakeholders to work together and achieve mutual goals (Lachapelle and McCool, 2005). It is not clear, as stated in the literature review (Chapter 3), if more engagement leads to better results in planning and policy processes of collaboration. Engagement processes are usually characterised by power inequalities between the stakeholders, allowing some actors the possibility to veto the process. Deep power differences can transform engagement processes into 'talk shops' where decisions are delayed (Reed, 2008). Debate continues about what constitutes a legitimate stakeholder as interests, needs and priorities are continually changing (Brody, 2003).
Coordination	Aside from engaging with stakeholders, implementing a plan or policy collaboratively also requires coordination, which refers to the degree of alignment or integration between policies and plans of different actors (Higgins et al., 2014). In the collaborative governance literature within environmental planning and policy, there has been little focus on this coordinative aspect, with few theoretical or practical discussions. Morrison et al. (2004) is one of the few studies that have focused on discussing the coordination aspect of collaboration. Contrary to the present study, Morrison et al. (2004) consider coordination as an element of integration. Coordination is one of the most challenging aspects of collaborative governance, given the fragmentation between government levels in federal systems such as Australia, and the consequent difficulty of defining their roles and responsibilities (Higgins et al., 2014). Cooperation is a key part of the coordinating aspect within collaboration as it is the "process where parties with similar interests plan together, negotiate mutual roles and share resources to achieve joint goals but maintain separate identities" (Morrison et al., 2004, p. 248).
Regulations	The literature on collaborative governance includes regulations as part of the key aspects of this approach: despite the apparent contradiction of using regulations to collaborate. Through pragmatic lenses, regulations are believed to underpin and reinforce collaborative efforts, and rules should even be developed through collaboration (Ansell, 2012). Regulations belong more to top-down or hierarchical governance approaches (Jessop, 2011). However, this policy instrument has been incorporated in network or collaborative governance approaches as regulations are considered necessary to underpin collaborative governance efforts in environmental policy and planning. For instance, Scott and Thomas, (2017) include regulations in their conceptualisation of collaborative governance, arguing that this instrument is fundamental in collaborative processes. This view is also shared by Emerson et al. (2012), who include regulations in their collaborative governance concept and practice.
Public participation	Public participation is different to stakeholder engagement as it refers to a wider form of participation. Stakeholder engagement involves the people directly involved in the environmental planning issue, while public participation seeks to include the general citizens located in the area of the issue, whether it is a community, region or city. Supporting public inclusion is the argument that citizens or communities that depend more on a given natural resource are the ones with the least say on how that resource should be used (Buchy and Race, 2001). Instead of offering a pragmatic benefit, public participation renders more a democratic quality to the governance process, allowing the possibility to redistribute power to those actors that usually lack any power (McCool and Guthrie, 2001).
Learning	Learning occurs mainly when stakeholders engage and when the public participates in NRM planning, but also through open and representative decision-making processes. Apart from underpinning behaviour change, another role of public learning is to generate knowledge by transferring it between the members of the community. Considered one of the beneficial products in the deliberations between stakeholders and the community, learning is emphasised in the NRM literature as a tool for solving problems that complements the traditional technical responses (Muro and Jeffrey, 2008). Local knowledge is prioritised in this process. Similar to the other governance elements, there is limited research about the role and impact of learning within natural resource planning and management.
Decentralisation	Devolving responsibility for the delivery of environmental outcomes to local levels is also known as decentralisation. This is another important aspect within collaborative governance processes, in which state actors usually delegate implementation of environmental plans and policies to non-state actors at lower levels. In the context of GBR natural resource planning, delegation to non-state actors such as the NRM groups and the agriculture industry groups entails a decentralisation of power from the centre to regional and local levels. The process fits with the 'subsidiarity' principle, which states that lower levels of governance are in a better position to deal with regional or local issues as they are closer to the issues and, therefore, their knowledge is decisive (Marshall, 2007). Or as Wyborn and Bixler (2013) argue "the relevant principle, sometimes called the subsidiarity principle, may be phrased thus: the goal

	should be as much local solution as possible and only so much government regulation as necessary" (p. 59).

This chapter is divided into four parts. First, I present the methods of data analysis followed in the process-outcomes evaluation on the impact of collaborative governance on environmental outcomes. I order them separately for practical purposes, explaining first the process-oriented evaluation and then the outcome-oriented evaluation. The second part focuses on the results of the evaluation, where I follow the same structure as in the methods section, organising the results in process-oriented and outcome-oriented. However, both refer to the same evaluation process I used to analyse the impact of collaborative governance on the water quality outcomes of my case study.

The collaborative governance processes are classified as positive, negative and neutral, in terms of what aspects facilitated or blocked the achievement of water quality outcomes. The third part discusses the results; relating the findings to the literature and identifying the outcome-oriented evaluation, identifying the strengths and weaknesses of the collaborative governance approach in its achievement of water quality outcomes. Finally, the main findings are summarised in the conclusion.

7.2 Methods

The examination of collaborative governance processes is based on the six collaborative governance processes criteria developed in Chapter 4 (Table 4.4). However, I added two more collaborative governance processes — incentives and competition — that are relevant for the case study. See Table 7.2 for more detail.

Table 7.2 Modified collaborative governance criteria on the impact of collaborative governance on environmental outcomes.

Collaborative governance criteria	1. Stakeholder engagement 2. Coordination 3. Participation 4. Learning 5. Regulations 6. Decentralisation 7. Incentives* 8. Competition*

*The researcher added two more elements to the criteria that are specific to the Reef case study: 7) incentives and 8) competition.

Following Rauschmayer et al. (2009), this study uses the two governance evaluation approaches (processes and outcomes) for a 'substantive' as well as an 'instrumental' reason. The substantive reason, argues Rauschmayer et al. (2009), identifies obstacles to implementation such as the information considered or ignored; the depth of deliberation during the collaborative approach; or the potential conflicts among the stakeholders. The analysis refers to these implementation obstacles as the weaknesses of the collaborative approach. The instrumental reason promotes a learning process among the actors and organisations involved that facilitates the governance process. The study refers to this learning process as the strengths of the collaboration, after the planning intervention took place.

In the end, this might contribute to improvements such as addressing the weaknesses of the collaborative governance arrangements for implementing water quality plans. Rauschmayer et al. (2009) add a 'normative' reason for combining processes and outcome-oriented evaluations, which refer to principles of good governance. In this study, normative valorisations, such as principles, are not considered: the focus here is on identifying the strengths and weaknesses of collaborative governance in plan implementation, rather than providing a good governance diagnosis.

The process-outcomes governance evaluation uses the stakeholder perspectives obtained from the semi-structured interviews, and the water quality data from the *2009 Reef Plan* monitoring. The process-oriented assessment is based on rankings from the interviewees about the eight aspects of the collaborative criteria (Table 7.2). The assessment criteria relies on the perceptions of stakeholders, which are designated by Rauschmayer et al. (2009) as empirical research, constituting one of the two main sources for assessing collaborative or participatory governance processes. The outcome-oriented evaluation is positioned as the consequence of these processes and this evaluation identified the impact of collaborative processes in terms of being positive, neutral or negative for the achievement of environmental outcomes. The outcome-oriented analysis discusses the effectiveness of the planning intervention based on the governance processes. Effectiveness is viewed as the difference between the water quality plan targets and the water quality outcomes.

7.2.1 Process-oriented evaluation

The evaluation of collaborative governance processes uses the set of criteria presented in Table 7.2 of this chapter of collaborative governance in environmental policy and planning. The assessment criteria integrate the key aspects of collaborative governance that have been examined by previous studies in the environmental policy and planning domains. For the purpose of the process-based evaluation, a set of statements for each criterion were assessed by the stakeholders interviewed. The assessment of the statements was done based on a five point Likert scale: Strongly Agree; Agree; Neutral; Disagree; and Strongly Disagree (5=Strongly Agree; 1=Strongly Disagree).

Figure 7.2 shows the scale in more detail. The results were analysed using Excel to group the results from the Likert scale and obtain the percentages on the views of the stakeholders regarding the collaborative governance processes. The results are presented using radar graphs. Each process of collaboration included a number of statements that focused on the implementation phase of planning and their impact on the water quality outcomes. The set of statements assessed by the interviewees is shown in Appendix E.
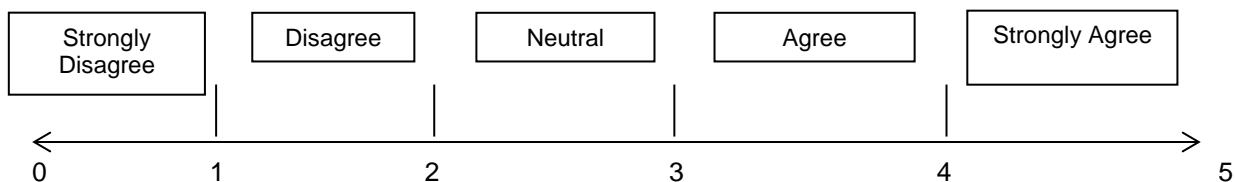
Figure 7.2 Rank of collaborative processes on their impact on environmental outcomes.

Reponses to these statements were obtained from twenty one interviewees[6] that were directly involved in either: the implementation of *2009 Reef Plan* and *Reef Rescue* throughout 2008 to 2013; the final stages of the program; or had detailed knowledge of program implementation and results. Interviewees included: federal government; state government; regional NRM bodies; agriculture industry; conservation sector; and academic sectors. In this section, the study complements each of the collaborative criterions with comments made by the same 21 interviewees to illustrate or reinforce their views. The analysis links the results from the interviewees with previous international studies to compare the evidence, and to provide an additional benchmark

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[6] Contrary to the previous chapter, where 22 stakeholders participated, in this part of the study 21 participants collaborated as one participant preferred not to answer the statements.

from the scientific literature. Table 7.3 presents the distribution of participants per stakeholder group as well as its interview codes.

Table 7.3 Distribution of participants in the general evaluation of collaborative governance and its impact on environmental outcomes.

Stakeholder group	No. of participants	Interview code
Agriculture industry	3	AI1; AI2; AI3
Conservation sector	1	CS1
Federal government	1	FG1
Regional NRM bodies	11	RB1; RB2; RB3; RB4; RB5; RB6; RB7; RB8; RB9; RB10; RB11
State government	4	SG1; SG2; SG3; SG4
Academic sector	1	AS1
Total	**21**	

7.2.2 Outcome-oriented evaluation

Through different paths, good governance processes promote good governance (Stirling, 2006). Moreover, "the governance process will shape the outcomes and therefore becomes intimately wrapped up with the process" (Peters, 2016, p. 310). Most likely, good processes of collaboration produce good outcomes such as social or environmental improvements (Innes and Booher, 1999; and Carr et al., 2012). In this evaluation, I argue that improved governance processes would very likely contribute to achieve better water quality outcomes. Or, conversely, that issues in the governance processes contribute to block the achievement of the expected water quality outcomes.

For this study, good governance facilitates or enables the achievement of expected environmental outcomes, which improve the environmental health of the area/ecosystem intervened (environmental outcomes become the benchmark to which governance processes are compared). Rotberg (2014) suggests good governance means being effective at achieving the targets of an environmental plan or policy, based on the governance processes that drive or steer a plan, such as the water quality plan of interest here. The outcome-oriented evaluation is done backwards. From the final results, the water quality outcomes, to the processes in order to offer a more detailed

picture than the one offered by the water quality data. In other words, I present the collaborative governance story behind the numbers (see Table 7.4 for the water quality outcomes achieved by the *2009 Reef Plan*).

The governance developments behind the environmental outcomes would allow a better understanding of how collaboration contributed to the achievements of the water quality plan. This assessment is based on the stakeholder perspectives regarding the governance processes. The participants' perceptions represent a second measure, additional to the official water quality data, to complement the analysis around the effectiveness of collaboration. They represent indirect measures of the environmental outcomes in outcome-oriented governance evaluations (Mandarano, 2008). The purpose is to offer more clarity on the link (featured in Figure 7.1) between the collaborative governance processes, its output and consequences (e.g. environmental outcomes). This might reduce the uncertainty that characterises complex environmental issues, such as water quality.

Table 7.4 Water quality outcomes achieved per NRM group in the *2009 Reef Plan* (Queensland Government, 2014).

NRM Group	Reduce nitrogen by 50% (by 2013)	Reduce sediment by 20% (by 2020)	Reduce pesticides by 50% (by 2013)	Overall water quality condition
				Big/Dry/Graze
NQ Dry Tropics	10%	16%	13%	Moderate
FBA	3%	4%	5%	Poor
				Small/Tropical/Sugar
Reef Catchments	17%	9%	42%	Moderate
Terrain NRM	8%	13%	26%	Poor
				Medium/Tropical/Mild
Burnett-Mary	15%	3%	28%	Poor
Cape York	6%	8%	0	Moderate
GBR catchment	**10% (low contribution in reducing nitrogen, not even half the target)**	**11% (moderate contribution, a bit more than half the target was met; longer time-frame)**	**28% (moderate contribution, a bit more than half of the target was met)**	**Poor**

7.3 Results

The results of the general evaluation of the case study are presented in two parts. The first one presents the results of process-oriented collaborative governance evaluation, which is based on each collaborative governance process of the criteria used by this study (Table 7.2). The second part links the results of the process-oriented with the

outcome-oriented in order to provide the general picture of the impact of collaborative governance on water quality outcomes achieved by the *2009 Reef Plan* (Table 7.4).

7.3.1 Process-oriented evaluation

7.3.1.1 Stakeholder engagement

The purpose of assessing stakeholder engagement was to explore the extent to which the involvement of key stakeholders in the implementation of Reef Rescue contributed to the achievement of the *2009 Reef Plan* water quality targets. In the responses, however, there is no clear differentiation between the engagement on plan development and plan implementation. It was seen by the interviewees as a continuum that led to the results of the program. Within the process evaluation, stakeholders rated three statements that explored the impact of stakeholder engagement on water quality outcomes (see Appendix E for more detail). Given the focus of my study is on the relationship between governance and environmental outcomes, the assessments on the quality of engagement or the sense of ownership from the process were considered out of scope of this study.

There was consensus among the stakeholder views on the positive contribution of engaging stakeholders. Around 57% of the respondents strongly agreed on the statement that the stakeholders were engaged during implementation and that this led to better water quality outcomes. The rest agreed on this statement and none of the respondents strongly disagreed. This supported one of the objectives of the *2009 Reef Plan*: to use a partnership approach for developing and implementing the plan (Queensland Government, 2009). Figure 7.3 shows the distribution of stakeholder rankings for each statement of the stakeholder engagement process. Most respondents (around 90%), emphasised that the engagement between regional NRM bodies and regional industry groups was the major contributor for better achievements. Interviewee RB7 argued that the level of stakeholder engagement was unparalleled:

> "This was the first time in terms of Reef investment or Reef intervention that we actually had multiple stakeholders actually trying to work together. It certainly wasn't perfect by any stretch, but at least we had industry, we had NRM on the same page, and working towards the same goals. It is the first time it happened at that scale, whole of Reef."

This confirms, as discussed in Chapter 6, that collaboration at the regional level (rather

than state or federal) had the most decisive impact on the outcomes. On the other hand, collaboration of the conservation sector — represented by an international conservation NGO — occurred mainly during the development of the *2009 Reef Plan*. Their role was minimal during implementation.
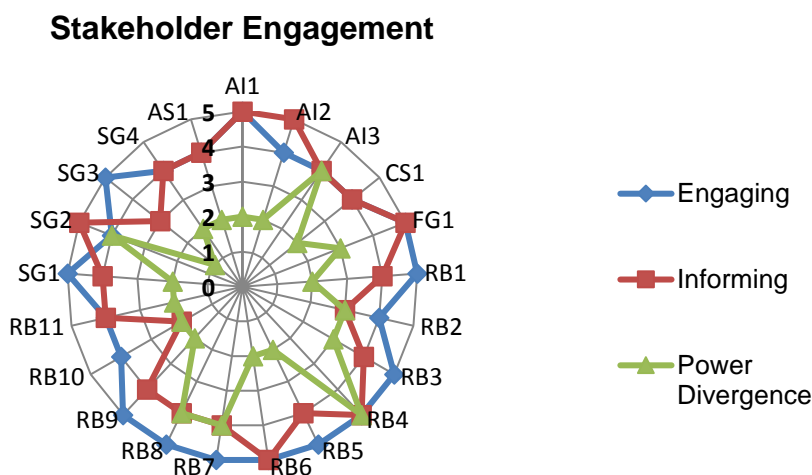
Figure 7.3 Stakeholder rankings of the statements on stakeholder engagement.

One purpose of stakeholder engagement is information sharing. In Chapter 6, interviewee RB8 commented that exchanging information was the main benefit of the collaborative approach. The exchange occurred through a vertical process, from the federal level towards the regional and local levels, rather than horizontal, such as between regions or from the local level and upwards. A respondent from the regional NRM sector (RB9) supported this approach by stating that information was a one-way process that did not promote a two-way dialogue:

> "Just because the stakeholders were informed doesn't mean they chose to inform themselves, so the level of understanding that was achieved, you know, I might tell you something but it doesn't mean you hear me or understand me, so you need that feedback, that dialogue. Consultation has gotta be two-way."

Most of the respondents (86%) agreed or strongly agreed that the stakeholders were informed periodically about implementation progress (Figure 7.3). Two remained neutral about this statement and one disagreed with the information sharing process in place. The respondents, on the other hand, did not provide details about the means or tools used to share information. In addition, they did not differentiate between formal or informal channels of exchange. In this regard, respondent RB7 explained that the

process of sharing information was "patchy." There was no explicit objective in the *2009 Reef Plan* about information sharing, although it was embedded in the partnership approach in the form of close stakeholder consultations that should have been followed during implementation.

The views regarding differences in power and access to resources among stakeholders as not affecting the achievement of water quality outcomes reduce the beneficial impact that stakeholder engagement had in the *Reef Plan*. In this regard, 62% of the respondents disagreed or strongly disagreed that different power levels as well as access to resources between the stakeholders did not have an impact on the achievement of the water quality outcomes (Figure 7.3). These respondents considered that power divergences were evident and they had a negative impact on the implementation of the plan. However, they were careful not to identify the powerful actors that benefited from this perceived power imbalance. Of the responses, 24% though agreed or strongly agreed that power differences between stakeholders did not influence the achievement of water quality outcomes. However, 14% of responses remained neutral.

In terms of access to resources and power, the federal and state governments were the most powerful actors, although it is not clear that they gained the most benefit from the water quality outcomes achieved, particularly since water quality is still a pressing environmental planning issue. The other powerful actor, the agriculture industry, seemed the one that gained most from the outcomes, as it did not compromise as much as was expected in terms of practice change. This was not supported by the interviews, but the evidence for this could be based on the agriculture land management practice outcomes for grazing, sugar cane and horticulture that fell short of the original targets (Queensland Government, 2014).

Nonetheless, interviewee AI1 from the agriculture sector said that the NRM bodies had more power as they administered the funds of *Reef Rescue*:

> "Certain industries had limits to the incentives they could access and some of the practice change had more of a public than a private benefit (e.g. fencing areas), which didn't have the profitability expected by the agriculture industry."

Aside from this, land management practice changes led to less profitability for some industries and had more public than private benefits. Interviewee SG1 explained, on the

other hand, that the resources such as funding were not available to all potential providers. Some funds were allocated without clear water quality outcomes evident. Nonetheless, the respondents preferred to avoid any political discussion about the matter. In this statement, the general agreement was that divergences in power and resources represented a barrier for the achievement of the environmental outcomes of the plan.

7.3.1.2 Coordination

For practical purposes in the GBR context, coordinating is considered as dealing with the alignment and integration between the efforts at the federal, state, regional and local governance levels. Integrating the efforts requires cooperation from all the governance levels involved as well as defining clearly the responsibilities between the stakeholders at each governance level.

Around 71% of the respondents agreed or strongly agreed that stakeholder's responsibilities were clearly defined. The rest remained neutral or disagreed (see Figure 7.4 for more detail). Respondents felt that this aspect worked out well in *Reef Rescue's* implementation because, as interviewee FG1 explained, they were contracted to perform specific roles. For instance, the regional NRM bodies were selected to deliver the water quality grants. These entities, for their part, engaged, along with the regional industry groups, the landholders by awarding them the grants to improve land management practices. This also points out to the limited nature of collaboration, which was viewed in practice as a working relationship supported by contracts, more contractual than relationship-building oriented.
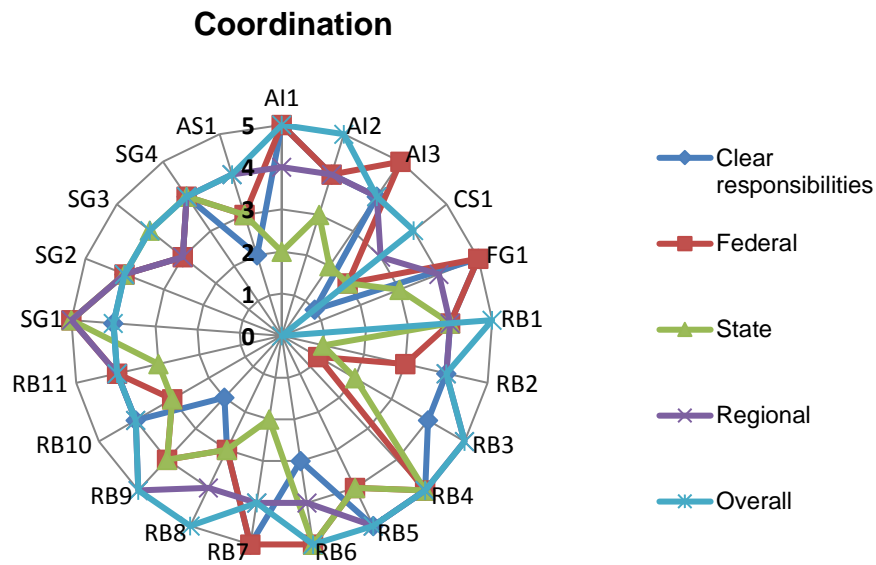
Coordination

Figure 7.4 Stakeholder rankings of the statements on coordination.

Figure 7.4 combines the five statements that focus on the extent of cooperation from the federal, state and regional levels when implementing the *2009 Reef Plan*, as well as the clear definition of responsibilities among these governance levels. Most of the respondents (67%) agreed or strongly agreed that the federal government effectively cooperated in implementing the plan's objectives. The respondents recognised this cooperation as adopting a top-down or hierarchical form through which this stakeholder provided the funding for Reef Rescue. With the state government cooperation, there were mixed views among the respondents. Around half (42%) agreed or strongly agreed that this stakeholder cooperated with the planning effort as it also provided funds; but more than half disagreed (29%) or were neutral (29%) about this cooperative role due to the fact that the state government introduced regulations unilaterally during the implementation process.

Some of the interviewees that disagreed suggested leaving aside this stakeholder from the collaborative scheme as they halted rather than promoted coordination. At the regional level, there was consensus about the effective cooperation between the regional NRM bodies and the agriculture sector (90% agreed or strongly agreed on this statement). This reinforces the view — discussed in Chapter 6 as well as with the evaluation of stakeholder engagement — that regional collaboration was the most important for implementing the water quality plan. Finally, the evaluation shows a general agreement regarding the fifth statement on cooperation among all the

stakeholders (95% agreed or strongly agreed on this statement). This renders the impression that the stakeholders were satisfied with the level of cooperation between them and, in turn, comfortable with how coordination unfolded in the *2009 Reef Plan*. It must be noted, however, that this satisfaction refers mostly to the federal and regional levels. The state government was viewed as an outsider that disrupted the coordinative effort through the regulations. As interviewee RB7 stated:

> "So we had *Reef Rescue*, which was a voluntary program, primarily about incentives, and then what happened at the same time is the state government introduced regulation, and there was no, there was little thought given to how you might integrate and deliver these two programs. So the regulation caused an enormous amount of discontent in the industry and, actually, made engagement around *Reef Rescue* very difficult."

7.3.1.3 Regulations and Incentives

Apart from engaging public and private stakeholders and seeking to coordinate the outputs of these engagements, another important aspect of the collaborative process is regulations. Regulations were used as part of the tools to implement the *2009 Reef Plan*. They were targeted to sugarcane and grazing land uses, the largest agricultural land uses as shown by Figure 5.3, Chapter 5. As it was stated in previous chapters, *Reef Rescue* consisted in providing incentives to change the behaviour of landholders. The program represented the 'carrot', while the regulations were the 'stick' of the water planning effort. For that reason, in this section the key regulatory aspect of collaboration is contrasted with incentives in order to find out how the stakeholders viewed the combination of these policy instruments. In their evaluation, the stakeholders highlighted the existence of tension between the simultaneous use of regulations and incentives.

Although some of the interviewees mentioned that these two instruments complemented each other, Figure 7.5 shows that, in more than half of the rankings (52%), incentives and regulations opposed each other, highlighting the tense relationship found between these two measures for changing landholders' behaviour. This opposition is illustrated by the contrasting positions of blue and red lines in Figure 7.3, where stakeholders that strongly agreed or agreed that voluntary adoption of practices led to better water quality results, at the same time, disagreed or strongly disagreed that regulations also promoted the achievement of better water quality outcomes. Others preferred to remain neutral about the regulations, although they agreed or strongly agreed on incentives. In

the rest, respondents prefer to remain neutral with either tools, or agreeing on both. Only one respondent disagreed on incentives and agreed on regulations.

The interviewees from the state level explained that as a governance design, it makes sense that regulations complement incentives, as enforcement instruments are designed to change the behaviour of those that are not motivated by the incentives. However, during the implementation of the water quality plan, the introduction of regulations generated anger and distrust among the regional and industry stakeholders. As interviewee AI1 explained:

> "Some farmers are probably going, well, why am I going to make this investment in my farm if you're only going to regulate me? Why am I going to put all this money? So there were issues there."

The regulatory measures were introduced without any form of consultation or collaboration by the state government. This unilateral decision reduced the momentum of the *2009 Reef Plan* and *Reef Rescue* implementation strategy. The general perception among the respondents was that they had a negative impact of the achievement of the water quality outcomes. This view is illustrated by interviewee RB6:

> "Nobody likes being told what to do, so it's about people making decisions themselves, and sometimes you need to incentivise what you're trying to get them to do to get them to take that step. Now, when we talk about best management practices and that teaching people that there's a two-fold outcome: they can profit by better use of land and, in turn, you can get an environmental outcome as well. That's the key thing. For some of the groups, you need to be able to offer incentives that make them decide what the projects are and what they're going to do, because every landholder will have a list of projects: it's about you changing the priorities by offering incentives."

Incentives vs Regulations
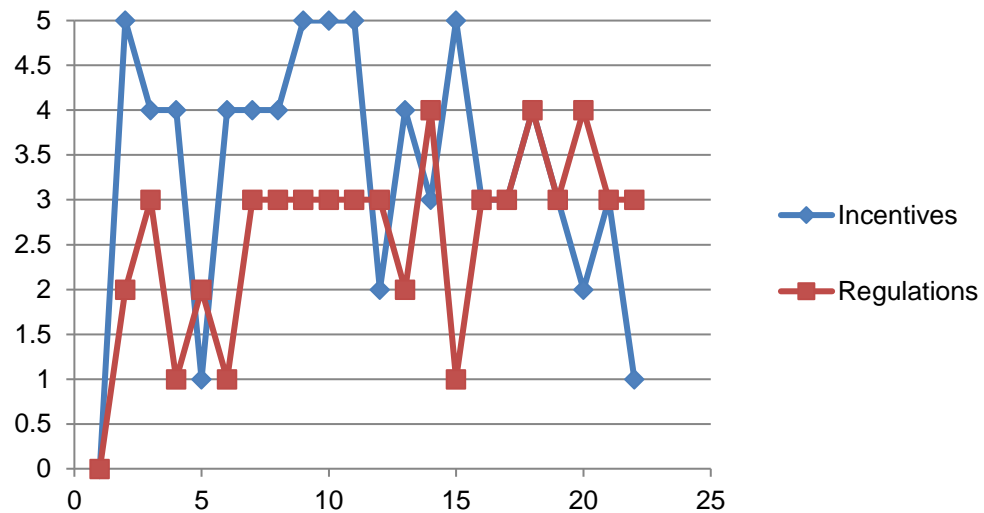
Figure 7.5 Stakeholder rankings on the impact of incentives and regulation tools in achieving water quality outcomes.

More than half of the interviewees argued that the decision to introduce regulations during *Reef Rescue* implementation were due to political motives. Although the same political party was in power at the state and federal levels, the governments had different agendas and objectives. In a sense, the uncoordinated efforts and power inequities from both levels of government (in which the state government was viewed as the non-cooperative and 'outsider' actor) led to a negative impact of regulations. In other words, the lack of coordination and power divergences between the levels of governance found in the previous evaluation sections added to a fail attempt at regulating land management practices. The most adverse reaction to regulations came from the regional level, such as the regional NRM bodies and the regional agriculture industry, who considered that this 'stick' instrument promoted fear and reluctance to change among the industry:

> "I'm a strong believer regulations don't work. I don't care who the individual is nobody likes being told what to do, so it's about people making decisions themselves, and sometimes you need to incentivise what you're trying to get them to do to get them to take that step" (RB5).

Interviewee SG2 added that, overall, it was not possible to evaluate the different impact

of regulations and incentives on land practice change and water quality outcomes. Official evaluations only accounted for total behaviour change of landholders as the evaluation tools available did not allow to examine the individual impact of each policy instrument on the plan results.

In line with the first statement, on the view that regulations ineffectively promoted compliance with the Reef plan's objectives, most of the respondents were neutral (24%) or disagreed (38%) that the regulatory tools increased understanding of practice change (see Figure 7.6). Two of them declined to rate this statement (RB2 and RB3); arguing that they did not have sufficient knowledge to answer it (this explains the absence of two points in the radar of Figure 7.6 regarding the understanding aspect). The rest of the respondents (29%) agreed on this statement, which suggests that while they understood the objective of regulating, they did not agree with its purpose of promoting practice change.
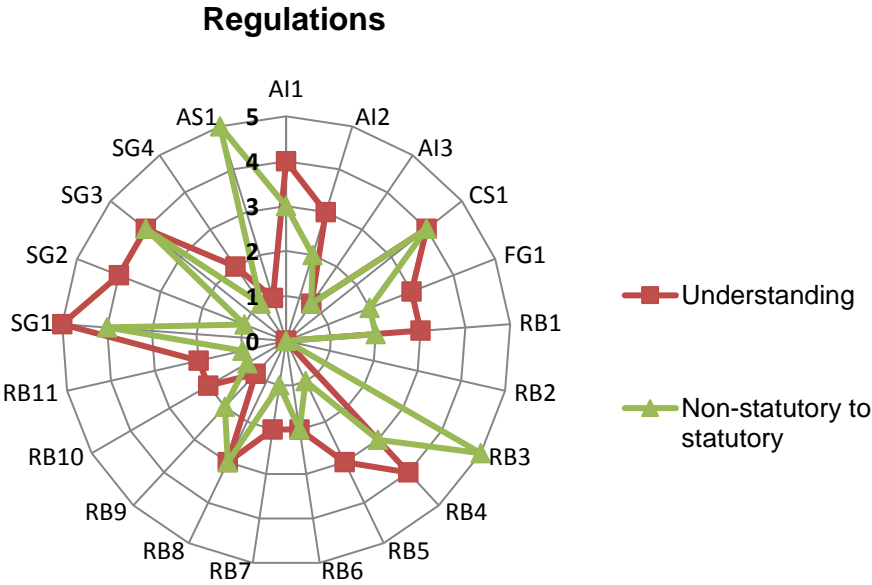
Figure 7.6 Stakeholder rankings of statements of regulations.

The evaluation of the regulatory aspect of collaboration included a statement focused on the regional level of collaboration led by the regional NRM bodies. It was designed to evaluate the role of this non-profit institution in the implementation and achievement of water quality outcomes. It is worth explaining that the NRM bodies are non-statutory collaborative organisations, which in practice means that they their outputs or actions

have no legal binding. If they were statutory organisations that had legal power, perhaps they would be able to achieve better environmental outcomes.

However, only 23% of respondents agreed with the view that becoming statutory organisations would lead to improved achievement of water quality outcomes. Obtaining the percentage views from Figure 7.6, most of the stakeholders thought (57% disagreed or strongly disagreed) that the shift from non-statutory to statutory bodies would have a negative impact on the water quality outcomes, mainly because they would lose legitimacy and trust at their regional level. Becoming a statutory body would make them appear as a government institution rather than the community nature that the non-statutory condition grants them. This view reinforces the overall negative impact attributed to regulatory tools in the water quality planning efforts.

Finally, contrary to the negative impact attributed to regulations, there was consensus between the respondents (95% agreed or strongly agreed) that providing incentives effectively drove practice change among the landholders. This highlights the positive stakeholder view on the incentives, and the reason why most of them were comfortable with *Reef Rescue.* Only interviewee AI3 disagreed with this statement, explaining that what actually drove land practice change of landholders was a previous culture of land stewardship as well as opportunities to gain more profits. However, this does not contradict the second statement on incentives, as incentives can be seen as a form of profit for the agriculture industry.

7.3.1.4 Public participation

In this study, public participation is viewed as an aspect that reinforces collaboration by including the views of the citizens, or the community, in the solution of the natural resource planning problem. Figure 7.7 indicates the response ratings from the interviewees, in which there was partial consensus on the view that the interests of the citizens within the regions were not incorporated in the water quality plan. 71% of the responses strongly disagreed, disagreed or remained neutral about the inclusion of public participation in the implementation of the program.

Moreover, 14% of them were even surprised by this statement as they pondered that public participation was not required in the planning process, either at the development or implementation stages. Respondents from the regional NRM sector and the state

government, nonetheless, perceived that citizens were included in the implementation process. On the other hand, while the public did not participate directly in *Reef Rescue*, in the majority of the respondents' view (52%) suggested at least it was informed about the progress of the program and this was beneficial for the water quality outcomes achieved. However 48% disagreed or remained neutral on the second statement, explaining that citizens were informed periodically through raising-awareness events developed by the NRM groups as well as through their newsletters; however, it was not clear for them if this had any beneficial impact on the water quality outcomes achieved.

Public Participation
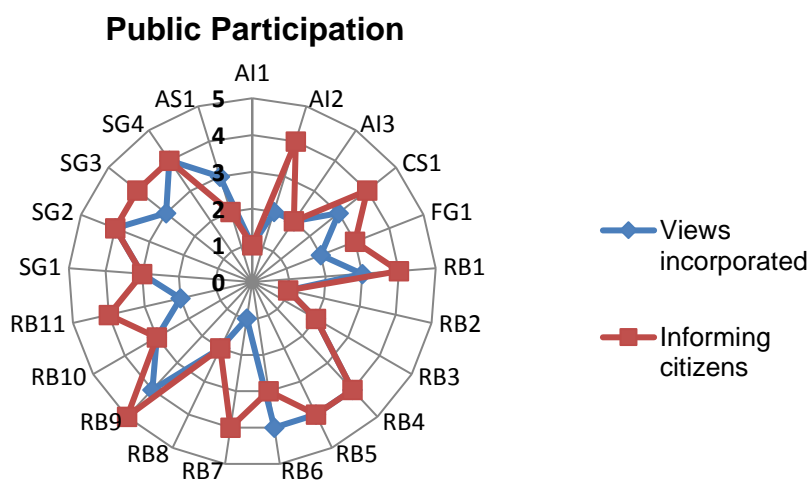
Figure 7.7 Stakeholder rankings of the statements on public participation.

7.3.1.5 Learning

One of the expected benefits of collaboration is the process of learning that it allows. Through collaborating and sharing information, the actors learn from their planning experiences to improve them in the future, such as adopting better practices, re-define objectives and goals, or improve communication between the stakeholders. In the stakeholder engagement aspect, it was highlighted that the information exchanged between the stakeholders was the main benefit during *2009 Reef Plan* implementation. Information sharing, on its part, promotes the learning process that facilitates adaptability, which is required when dealing with complex issues, such water quality in a large ecosystem.

Either promoted by collaboration or not, it seems that since 2003, the stakeholders of Reef's water quality planning have been involved in a learning process. This is illustrated

by the three subsequent GBR water quality plans over 2003 to 2013, each intending to improve or amend the previous effort. The recent *Reef 2050 Plan*, published in 2015, can also be included in this learning process as it considers water quality among its key themes to protect the GBR (Australian Government, 2015b). Collaboration was adopted as a governance approach in 2009 and onwards. Hence, it is expected that collaborative governance in the planning process reinforced learning. The evaluation of learning by the respondents intended to confirm the existence of this learning process, and its impact on the water quality outcomes. Three statements were rated by the respondents, in which they were not clear about the benefit that learning has rendered to water quality planning.

The majority of the respondents (67% agreed or strongly agreed) considered that learning occurred in the implementation of the previous *2003 Reef Plan*, which was beneficial for achieving the water quality outcomes (see Figure 7.8). However, 24% of the respondents (from the regional NRM and academic sectors) strongly disagreed or disagreed with this statement. No detail was provided about the ways that the previous plan experience contributed to achieve the water quality outcomes of the *2009 Reef Plan*. It was only assumed by the respondents that there was a positive legacy from the first water quality plan in 2003. The only concrete example of the positive impact of learning was that it allowed including the industry sector in the *2009 Reef Plan*, which was excluded from the 2003 planning process.
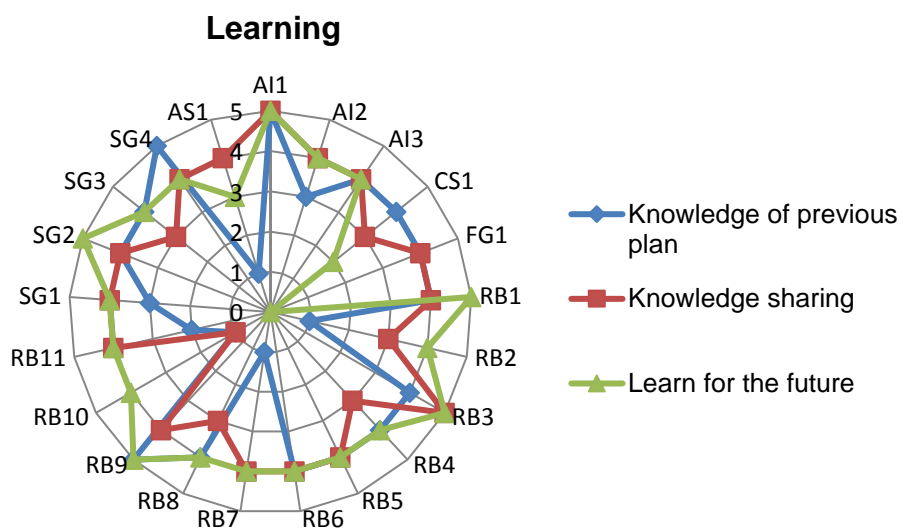
Figure 7.8 Stakeholder rankings of the statements on learning.

The information sharing that occurred during stakeholder engagement, particularly at

the regional level of collaboration, might have translated into knowledge to support *Reef Rescue* implementation. The majority of the respondents (71%) strongly agreed or agreed on the fact that knowledge sharing on the regional conditions (e.g. regional contexts or governance structures) took place during plan implementation (based on Figure 7.8 rankings). Nonetheless, interviewee RB7 added that learning was partial as the NRM groups did not exist when the *2003 Reef Plan* was devised. The groups were created around 2005. However, 24% of the interviewees were neutral about this statement as they were unsure about the knowledge process actually being shared. RB10 (representing 5%) strongly disagreed, considering that knowledge sharing did not take place at all.

Finally, 86% of the respondents agreed or strongly agreed that the experience with *Reef Rescue* as part of the *2009 Reef Plan* definitely provided the right path to deal with water quality (based on Figure 7.8 rankings). It allowed learning not only of what practices worked but also of which ones should be suppressed. This was proved by the *2013 Reef Plan*, which maintains the collaborative approach with slight adjustments in terms of the plan objectives and goals (Australian and Queensland Governments, 2013). Interviewee RB7 mentioned that, overall, *Reef Rescue* showed the utility of using incentives as a planning tool to motivate behaviour change. Only interviewee CS1 strongly disagreed with this third learning statement, arguing that so far progress towards the water quality objectives was limited. FG1 preferred not to answer about this aspect.

7.3.1.6 Decentralisation

In the Australian NRM context of environmental governance, and discussed in Chapter 2, decentralisation adopted the form of regionalisation, represented by the creation of the NRM regions. Previously, it was explained that decentralisation on the *2009 Reef Plan* implementation occurred from the federal to the regional level of governance, where the community-based NRM bodies were designated as the actors responsible to deliver the water quality outcomes by offering incentives to the target group: the landholders. My evaluation of decentralisation was based on three statements that focus mainly on the role of the NRM bodies in plan implementation.

Regarding the resources available for the NRM regions, only respondent (AI3) disagreed with their positive contribution to achieve water quality outcomes (see Figure

7.9). Most of the respondents' rankings (86% agreed or strongly agreed) show satisfaction with the resources that were in place to implement the plan, such as the funding received and staff knowledge and skills. Two remained neutral. A similar level of agreement was found with the third statement (76% agreed or strongly agreed) as only the same respondent AI3 disagreed on this, while four respondents, representing 19%, were neutral. In other words, most of the stakeholders found that devolving the delivery of the water quality objectives to the regional level was beneficial for the outcomes. However, two respondents from the agriculture sector (AI2 and AI3) felt that they had similar or better capacity than the NRM groups to become the vehicle of the water quality plan delivery. Without stating it explicitly, they hinted that if they had been given the role of the NRM groups perhaps better water quality outcomes would have been achieved.
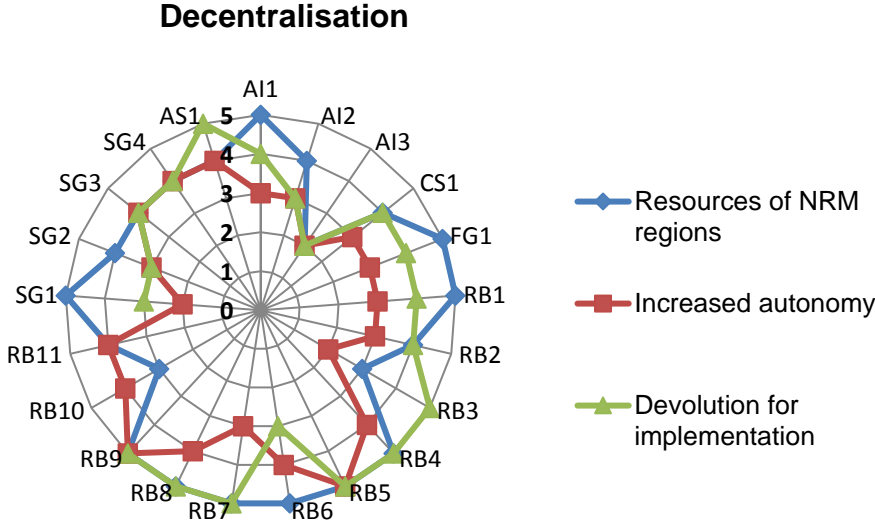
Figure 7.9 Stakeholder rankings of the statements on decentralisation.

Through the devolution of responsibility, the NRM groups also had more autonomy to deliver the plan. For instance, they were able to select the strategies they wanted to follow for engaging the landholders and allocating the water quality grants. This autonomy led to different collaborative approaches followed by each regional body that, in consequence, led to different water quality outcomes. In terms of the autonomy, around half of the respondents (38%) were neutral about its benefit on the outcomes, and around half (48%) agreed that it was beneficial. Those in the neutral position

maintained that the autonomy was not a significant factor for achieving the water quality outcomes.

Interviewee AI1 argued that the collaboration between the NRM groups and the industry bodies was more important. In this way, they were able to provide consistent information to the target group, increasing their adoption of better land management practices. Interviewee SG2 considered that the autonomy granted seemed a bit excessive and the NRM groups lacked enough guidance, particularly in the reporting methods followed (e.g. there was no standardised data reporting method across the NRM groups). 14%, however, disagreed on the beneficial role of autonomy provided to the NRM bodies. This position was illustrated by a comment from interviewee RB7:

> "It's actually a strength and weakness (the increased autonomy), so the strength is that it led to a lot of creativity and innovation, 'cause these organisations were autonomous, we could do what we liked. So, in that respect I think it was good. What it didn't, the flip side though, is that we end up with a lot of inconsistency in terms of subsistence, in terms of monitoring systems, evaluation systems."

7.3.1.7 Competition

Apart from incentives, competition is the second aspect I added to the collaborative processes criteria as it is another singular feature of the *Reef Rescue* strategy. That is, the incentives included to motivate behaviour change on the landholders were provided through a competitive process. Landholders were offered the financial resources (e.g. money or equipment) after presenting a water quality improvement project to compete for grants. The projects were evaluated by a panel that included people from the NRM groups as well as agriculture industry representatives. The grants were awarded to the projects that met their requirements (e.g. cost-efficiency and feasibility). In this regard, there is an apparent contradiction between adopting collaboration and drawing upon competition. These apparent contradiction or tension was reinforced by the fact that the six NRM regions were subject to the same water quality targets, despite their different contexts (such as land size, land uses and NRM bodies' governance structures).

Figure 7.10 indicates the respondents' assessment of competition. In the first statement, most of respondents (71%) were neutral or disagreed that competition led to better water quality outcomes. These views appear to show a general discontent with competition; however, the explanations offered about this statement were not against

competition. On the contrary, for these respondents better water quality outcomes would have been achieved if the competitive process was more efficient. For instance, usually there were more grants available than applicants, and the competition process limited itself to allocate the funds rather than promote the best water quality projects. In addition, the stakeholders interviewed explained that there was some sort of collaboration before competing for the water quality grants. This collaborative process occurred between the regional industry representatives and the landholders, in which the former helped the latter in developing their water quality proposals.
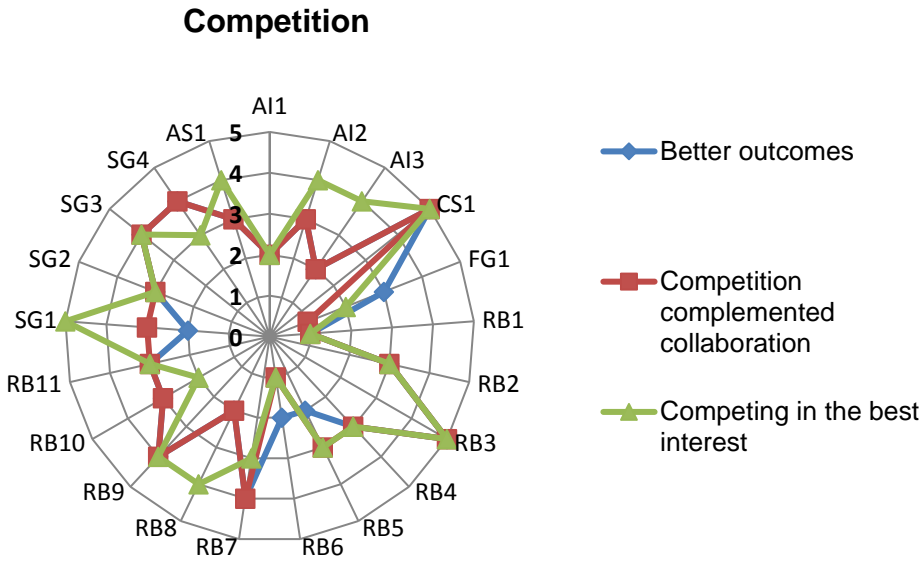
Competition

Figure 7.10 Stakeholder rankings of statements on competition.

The majority of respondents (71%) were either neutral or disagreed that competition complemented collaboration; while 29% agreed or strongly agreed on the opposite: there was complementarity between competition and collaboration. Most of the respondents that shared this view were from the regional NRM sector. This supports the finding that there was tension between competing and collaborating. As interviewee RB8 explained:

"So the competition there was not good for us, because it meant we weren't working collaboratively, we were competing; regions were competing for the money. The competing for money for stakeholders, I guess it was a good thing because you're trying to get people to think about what they wanna do and why, and to really do that for the right reasons.

However, sometimes it put people off because the smaller farmers, for instance, just went 'oh I'm not going to get a grant, because the big farmer is going to get the grant over me'."

In this view, competition not only affected the smaller landholders in their prospects to be incorporated in the water quality planning efforts. Competition was also identified by the respondents as a major factor behind the low or almost inexistent cross-regional NRM collaboration. Interviewee RB1 added:

"Within the Reef Alliance (the main collaborative institution of Reef Plan), the biggest sources of conflict were around money and competing for money. Overall, they agreed on what needed to be done with the water quality problem. Also agreed on how to do it, but in terms of who would manage the money and that... like BMP (best management practices) was a great example. The industry felt that BMP was theirs to lead, and yet there were a number of landholders who just wouldn't engage with industry."

Finally, regarding the final statement about competition being in the best interest of the stakeholders, there were mixed views from the respondents. Around half (43%) agreed that competing for grants was in their best interest, while the rest (57%) disagreed or remained neutral about this statement. This illustrates the contradictory impact of competition in *Reef Rescue* seen by the respondents. Moreover, the stakeholders did not deliberate around the suitability of using competition as this was decided solely at the federal level. Hence, they would have preferred more inclusion towards deciding how to allocate funding. Interviewee RB5 summed up the mixed views around the impact of competition by stating:

"I'm a firm believer that competition makes things healthy, because it keeps everyone on their toes. That being said, there is one Great Barrier Reef, there isn't twenty Great Barrier Reefs. There is one Great Barrier Reef region, there's not six regions, so it's like looking after yourself, you don't just look after the head, the wrist and the body and that, because the rest of the body will die."

7.3.2 Outcome-oriented evaluation

According to the official information, the collaborative governance arrangements were key for the successful delivery of the *2009 Reef Plan* (Australian Government, 2011; and Australian Government, 2014a). However, the official water quality outcomes fell short of the original targets. According to the simple effectiveness criterion, the water quality plan failed to significantly improve water quality. What is the contribution of

collaborative governance? And, given the complexity of the issue, is it valid to judge it as a failure? As I found in the previous chapter, more funding for on-ground delivery does not necessarily lead to better water quality outcomes; hence, the collaborative governance processes need improvements as well.

Apart from this, the external factors — such as land area, market shifts or weather impacts identified in the previous chapter — need also to be taken into account when determining if collaboration failed. As Rauschmayer et al. (2009) argue, better governance processes reduce uncertainty. Therefore, rather than providing a strong verdict regarding the success or failure of collaborating (a black or white picture), I offer a more nuanced outlook on the impact of collaboration, highlighting that collaborative governance is not the only variable that would lead to better environmental outcomes. In this sense, there is no cause-effect relationship between collaborative governance processes and environmental outcomes. Other variables, such as the regional context and the political arena have also a decisive role that was not taken into account for this governance evaluation.

The main assumption is that improving the collaborative governance process would lead to better environmental outcomes. And this is supported by the main finding discussed in the previous chapter. That is, despite funding, if there is strong collaboration in place, better environmental outcomes are likely to be achieved. How do you improve it? In the previous process-evaluation of collaborative governance processes of *2009 Reef Plan*, I seek to disentangle the key aspects of collaboration, how they performed in the views of the stakeholders, and also how they created new issues within the governance arrangements. So how do you improve the governance processes? The next section shows the impact of the governance processes in terms of being positive, neutral and negative to the environmental outcomes achieved. In the view of this study, the improvements in terms of governance arrangements should target the processes that had a negative impact. By rating the collaborative governance processes, I seek to inform policy about required amendments to the governance arrangements as well as establish further research areas within the environmental planning and policy areas. With better collaboration though, there is no guarantee that the intended water quality outcomes will be achieved. But, based on the collaborative processes ratings, it will at least facilitate them to a greater extent, allowing even to modify the targets and goals of the water quality plan through deliberation.

7.3.2.1 Impact of collaborative governance processes on water quality outcomes in the GBR

The purpose in this section is to explain the environmental outcomes through the outcome-oriented evaluation that is informed by the processes evaluation, on the belief that good governance processes contribute to better outcomes. From the water quality outcomes shown by Table 7.4, particularly the last column about overall water quality condition, the effectiveness seems low. Before the planning intervention, water quality was poor and it remained in the same condition after the intervention. However, without collaboration, according to the stakeholder views presented in Chapter 6, nothing would have been achieved. At least, the pollutant reductions began to occur. The water quality outcomes become the criteria through which I examine the issues in the collaborative governance process evaluated, based on the stakeholder perspectives around the collaborative-implementation criteria as well as the findings of similar research.

I seek to reduce the uncertainty by identifying what worked and what did not worked so well in the governance processes. Table 7.5 groups the results of the process evaluation, classified by positive, neutral and negative impact on the water quality outcomes. These results are complemented by Figure 7.11, which re-elaborates the Process-Outcomes governance evaluation framework with the findings of the case study. It is important to note that the uncertainty between governance processes and outcomes cannot be completely reduced as the external factors have to be taken into account. A potential further research area could be to focus on a number of external factors and measure their influence on the environmental outcomes. The next section discusses the results of this process-outcomes examination of collaborative governance in its impact on water quality outcomes.

Table 7.5 Impact of collaborative governance processes on water quality outcomes.

Collaborative governance process	Positive	Neutral	Negative
Stakeholder engagement	X		
Coordination			X
Regulations*			X
Public participation		X	
Learning	X		
Decentralisation	X		
Competition**		X	

*Incentives are embedded within the regulations element as they offer contrast between the two policy instruments used to implement the *2009 Reef Plan*.
**Competition was added to the GBR case study, as it was a unique feature not found in other collaborative processes evaluations.
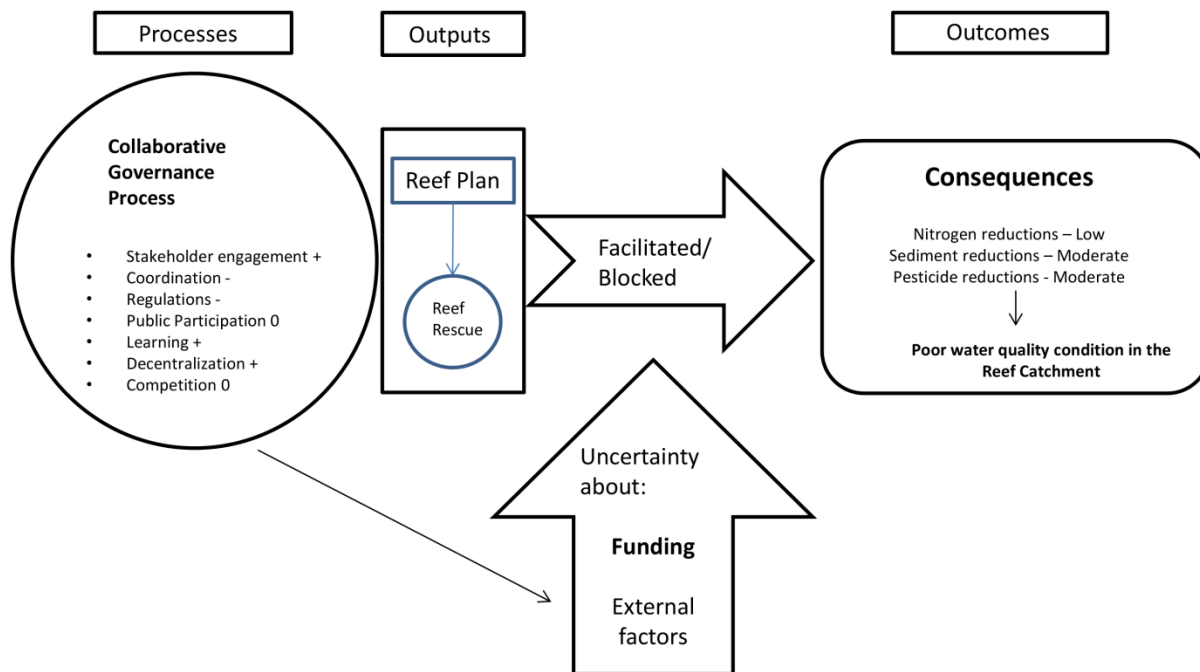
Figure 7.11 Process-Outcome governance evaluation framework adapted to the GBR case study results.

The (+) sign indicates a positive impact of the collaborative governance process, while (–) indicates a negative impact and (0) a neutral impact. The overall consequence was a poor condition of water quality in the GBR catchment after the collaborative governance planning intervention.

7.4 Discussion

7.4.1 Collaborative aspects with positive impact

Stakeholder engagement

The evaluation provided by the stakeholders to this collaborative aspect show satisfaction with the level of engagement during *Reef Rescue* (as part of the *2009 Reef Plan* scheme). All of them agreed or strongly agreed that including the stakeholders led to better water quality outcomes. In addition, more than 80% identified a positive impact of being informed regularly or, in other words, sharing information about the water quality issue and the best ways of dealing with it. The most significant impact of engagement occurred at the regional level. For this reasons — perceptions of beneficial engagement and information-sharing taking place — I consider that stakeholder engagement was positive for the achievement of the water quality outcomes of the *2009 Reef Plan*. However, its impact was limited by the perceived power imbalances between the stakeholders. Although the interviewees did not necessarily identify the most

powerful actors, it is implied that the state and federal governments as well as the agriculture industry were the stakeholders with more capacity to alter the course of events or 'shift the course of the tide'. Hence, the divergent power between the stakeholders (e.g. access to resources, introduce regulations or block measures) might have impacted the full potential of stakeholder engagement and, in consequence, this had a negative effect in the achievement of the water quality outcomes.

For instance, the state government had the ability to introduce regulations unilaterally to promote behaviour change according to their goals, while the agriculture industry had the capacity to reject and thus force the withdrawal of the regulatory instrument established by the Queensland Government. Power differences also impact on equitable access to resources. In this case, the federal government provided most of the funding for the implementation of the *2009 Reef Plan* through *Reef Rescue*. The other actors, such as the regional NRM bodies, agriculture representatives and landholders, did not have the ability to access other sources of funding. They were subject to the interests and preferences of the federal government. Additionally, the inequity in resource access was also reflected in the different funding amounts received by the NRM bodies to implement *Reef Rescue*. The majority of the stakeholders, then, were dependent on the funding that the central actor, the federal government, decided to offer.

Considering the evaluation of the three stakeholder engagement statements, engagement between state and non-state stakeholders was not only positive, but crucial for implementing the water quality plan, particularly because it allowed sharing information about ways to achieve the water quality outcomes. This links with the findings by Carter et al. (2015) and Ulabarri (2015), who found that engagement and joint action had a positive impact on environmental outcomes. In this regard, it is important to stress that the engagement that was crucial for the 2009 Reef Plan implementation occurred at the regional and local levels. This was also recognised by a previous independent audit of the water quality plan (Lloyd Consulting, 2010). Upper levels, such as state and federal, were more decisive during plan development. Notwithstanding this positive impact of engagement, the evaluation also found that there were power and resource differences that might have been a barrier for achieving the plan's water quality targets. Power and access to resources represent the political dimension of the stakeholder engagement process that is out of the scope of the studies

reviewed in Chapter 3 as well as in this study. This remains one of the areas that require further research, such as how do power divergences among the stakeholders shape collaborative governance and impact on the environmental outcomes?

Learning

In general, more than 50% of the respondents agreed or strongly agreed on the three statements used to rank the learning aspect. In the respondents' view, learning to deal with the water quality issue occurred not only from the past planning experience with the *2003 Reef Plan*. Learning also took place in the implementation process through knowledge-sharing of regional conditions, and what was learned with the *2009 Reef Plan* supported the development of future plan policies. As a consequence, and based on the positive experience with learning perceived by the interviewees, I identified a beneficial impact of the learning aspect within the collaborative governance effort to implement *Reef Rescue*. Moreover, a learning curve of adjustments and redefinitions of goals targets can be seen throughout the Reef's water quality planning efforts since 2003 until 2015, a period in which four water quality plans have been established for the protection of the GBR.

This learning curve, though, would show a slightly beneficial impact on water quality after the planning interventions. At least in the case of the water quality outcomes achieved by the *2009 Reef Plan* through the *Reef Rescue* strategy, the role of learning was beneficial to the environmental outcomes. More clearly, it contributed to adopt a collaborative approach that included the agriculture industry (a sector not considered in the previous planning process), which led to the provision of incentives for land management practice change, achieving, in the process, better results than the previous water quality plan. However, there were no detailed explanations about specific aspects where learning contributed. The respondents' rates only show that there was a general positive impact of learning on the water quality outcomes achieved in 2013. This fits with Mandarano (2008) study that also found a positive impact of learning on environmental outcomes. The positive impact of learning, on the other hand, is contradicted by a federal government report, which stated that the monitoring and evaluation mechanisms of the *2009 Reef Plan* (e.g. the *Paddock to Reef* program) did not promote learning. Instead, they only introduced onerous administrative paperwork (Australian Government, 2015c).

In their evaluation, the interviewees shared the view that the long learning process, involved in dealing with the complex water quality issue, has represented a case of adaptive management. Nonetheless, there are no studies that have examined this potential adaptation case in which collaboration is embedded. A further research area suggested by this study would be to find out if this learning process represents an example of adaptive governance or, on the contrary, a series of fragmented plans to deal with a still unsolved issue.

Decentralisation

According to the stakeholders' perceptions in this study, decentralising the implementation of the water quality plan to the regional level had a beneficial impact on the water quality outcome achieved. First, the resources devolved to the NRM regions through the NRM bodies facilitated the achievement of water quality outcomes. Second, for around 90% of the respondents, the NRM regions were the appropriate vehicle to deliver the plan goals and targets. Hence, both the role of the NRM bodies and the decentralisation of the plan for its implementation through regional collaboration were positive for achieving the environmental outcomes. Moreover, as it has been mentioned before, without these decentralising process that supported regional collaboration nothing would have been achieved by the plan. In other words, and according to the views of the respondents (stated also in Chapter 5), a centralised approach would have been unable to achieve any progress in terms of the water quality targets. Only one interviewee from the agriculture sector (AI3), suggested the delivery of the plan should have been done through the regional agriculture organisations instead of the NRM bodies. This view was based on the assumption that the agriculture organisations in the regions have more capacity to implement the programs.

On the other hand, the third statement about autonomy of the NRM groups is also adapted from a hypothesis developed by Scott (2015), who assumes that increased responsibility (translated as autonomy in this study) for a collaborative group is associated with beneficial environmental outcomes. According to the respondents' views, the association between increased autonomy and beneficial environmental outcomes is likely to be inexistent. Some would rather advocate for less autonomy and more standardisation in the governance processes. As stated in Chapter 2, this seems to reinforce the contradictions found in the collaborative approach used in the GBR. The tension highlighted between offering incentives and introducing regulations is

complemented by the apparent contradiction identified between granting more autonomy and developing regulations. For instance, allowing for more flexibility while also suggesting standardisation among the NRM regional approaches. A further research area is to explore how to achieve a balance between consistency through regulating, and innovation through autonomy.

Even though the respondents found that devolution and resources available for the NRM regions had a positive impact on the outcomes achieved, they were also reluctant about the benefits of increased autonomy for the NRM groups. However, they did not consider that the effects of autonomy had a negative impact on the water quality outcomes. So, in general, it seems that from the respondents' views, decentralisation was associated with beneficial outcomes. This positive impact of decentralising relates with the findings by Wild River (2016), in the sense that lower levels of government are likely to obtain more beneficial environmental outcomes if they are allowed to work beyond statutory requirements. It also supports the central role played by the NRM groups in the GBR's collaborative governance approach to natural resource planning.

7.4.2 Collaborative aspects with negative impact

Coordination

Within the multi-level governance setting of this case study, the interaction between the federal government and the regional bodies was considered positive by the interviewees. So was the interaction at the regional level between the NRM bodies, the agriculture industry organisations and the landholders. Even though the federal level interacted in a top-down manner with the regional actors, in the stakeholders view they cooperated as they provided funding to change land management practices during the five years of *Reef Rescue*. Overall, almost 100% of the respondents were satisfied with the levels of cooperation, leaving the perception that coordination among the federal, state and regional levels was positive for changing the land management practices that led to the achievement of the water quality outcomes. However, viewed in more detail, I consider that coordination had a negative impact on the implementation of the water quality plan due to two factors: 1) the unilateral introduction of regulations by the state government; and 2) the poor coordination ties between the state and federal governments. In the first factor, the lack of coordination of the state government with the other levels of governance regarding the introduction of regulatory measures impacted

the momentum of the collaborative scheme by reducing trust and increasing fears among the stakeholders.

Moreover, the poor coordination led to confusion about the role of regulations and their purpose. In the end, the state government withdrew the regulatory measures before the end of the plan. For this reason, around half of the stakeholders from the regional NRM bodies and the agriculture industry considered that the state level should not be considered as part of the collaborative approach. The second factor that impacted negatively on the water quality outcomes was the poor coordination between the state and federal levels. Each of them seemed to follow their own lead, without agreeing on the policy instruments or the funding mechanisms. For instance, interviewee RB12 mentioned that the federal government never recognised formally the regulations. Hence, the interaction at the upper levels of governance was not really collaborative, and the effort to deliver the plan was left to the regional level.

In line with the literature review of Chapter 3 — in which Koontz and Newig (2014); Kim, J. H., et al. (2015); and Rogers and Weber (2010) state a positive impact of coordination on environmental outcomes — this study found that coordination had a negative impact in the achievement of water quality outcomes. Moreover, although coordination was rated fairly well among the respondents, there was fragmentation among the higher levels such as the federal and state governments, which used different instruments (incentives and regulations) to foster behaviour change among the landholders. A federal government review also found that the implementation of NRM polices, such as the *2009 Reef Plan*, was fragmented (Australian Government, 2015c). The interviewees also suggested that fragmentation occurred at the regional level as there was almost an absence of cross-regional interactions. Additionally, some NRM groups had better cooperation than others. Nonetheless, this can also be explained by the informal networks of collaboration developed in their respective regions. Hence, another area that needs further research (but out of the scope of this study) is to investigate the contribution of informal collaboration processes between the stakeholders in coordinating tasks.

Coordination remains one of the most challenging aspects of collaboration, which highlight the difficulty in aligning the efforts of the stakeholders within a multi-level governance system. Aligning the efforts of state and non-state actors is compounded by the power divergences that exist among the stakeholders (which links with the

stakeholder engagement process). Usually, the most powerful actors align the coordinating objectives to their goals or disrupt the interactions with a measure or policy that advance their interests. The fragmentation that characterised the collaborative governance arrangements in the implementation of the *2009 Reef Plan* (and the difference between upper levels and the regional level of governance) led to tensions, such as the opposition between offering incentives and regulations, which will be discussed in the next section.

Regulations

The second collaborative process with a negative impact was regulations. The regulatory measures were worsened by the fragmentation of the multi-level governance system, in which the lack of coordination in aligning this instrument to the plan goals led to anger and confusion between the other stakeholders. Therefore, there was tension between using incentives to change landholder's behaviour and then introducing regulations with the same objective of changing behaviour. In principle, there seems to be a contradiction between collaborating and regulating as collaboration suggests voluntary participation, whereas regulation prompts compulsory engagement. However, theory on collaborative governance considers that regulations are part of the collaborative effort (Koontz and Thomas, 2006; Ansell and Gash, 2008; Ansell, 2012; and Scott and Thomas, 2017). There is no contradiction between collaborating and regulating within these collaborative governance conceptualisations. More precisely, regulations are a tool that supports collaborations (Scott and Thomas, 2017) and these regulations, on their part, should be developed through collaboration (Ansell, 2012).

In the views of the respondents of this study, nonetheless, the use of regulations contradicted the expected effect that regulating provides within collaboration, namely a complement to support the collaborative approach. In the stakeholders' evaluation, regulations undermined the collaborative efforts between the stakeholders and generated a conflicted environment. One reason could be that the regulations were not developed collaboratively, as theory assumes, but rather were adopted and implemented by the state government, which was a powerful actor within the governing arrangements with the ability to develop this instrument in a top-down fashion. Hence, the effect of enforcing instruments was negative for the achievement of water quality outcomes, which fits with Koontz and Newig (2014) study. This was also supported by an independent review of the *2009 Reef Plan*, which stated that the plan was not well

embraced due to the regulations, particularly by the agriculture industry groups (Lloyd Consulting, 2010). Within this collaborative aspect, a further area of research suggested is to focus on developing evaluation instruments to account for the impact of regulations on environmental outcomes.

Another interesting insight provided by the examination of a potential change from non-statutory to statutory bodies, which was based on a hypothesis developed by Scott (2015), states that increased formalisation of a collaborative group, that is stronger institutional presence, is associated with beneficial environmental outcomes. The hypothesis was modified and adjusted to the purpose of this study, where respondents were asked if they thought that the increased formalisation of the NRM bodies would lead to better achievements of water quality outcomes. More than half of the respondents considered that shifting the status of the NRM bodies between non-statutory to statutory organisations would be negative to their role in regional governance.

The non-statutory nature distinguishes the NRM bodies from the government, and according to the interviewees against the shift to statutory entities, this non-government or community-based reputation grants them the advantage of being considered part of the regional community, facilitating the role of engaging and promoting behaviour change. Hence, apart from the perceived negative impact of regulations by respondents in the achievement of water quality outcomes, the majority also rejected the idea that transforming NRM bodies into statutory entities would contribute to better achievement of water quality outcomes.

7.4.3 Collaborative aspects with neutral impact

Public participation

The majority of the respondents in the evaluation agreed that the views of the public were not incorporated in *Reef Rescue.* More than half, though, agreed that the public was at least informed about the progress of the program. While the lack of inclusion might suggest a negative impact of this process on the water quality outcomes, the fact that, according to the stakeholder views, the public was informed, neutralises this impact. Revisiting Arnstein's (1969) classic typology of participation, the role of public participation in the respondents' view resembles the act of informing or consulting,

where communication between the actors occurred through one-way rather than two-way flows of information: from the government to the regional communities. In other words, citizens received information but had no input in developing it. Therefore, it had a neutral impact on the water quality outcomes. This links with the lack of two-way dialogue or deliberation perceived in the stakeholder engagement aspect. Taken together, public participation and stakeholder engagement during the implementation of *Reef Rescue* did not promote dialogue from the bottom-up. It was perceived as a top-down process in which the regional and local actors followed the guidelines adopted at higher levels of governance, such as federal and state. It is important to mention that power inequalities between the stakeholders are also present in this process, in which the public remains the least powerful actor. Including the citizens, then, becomes an instrument for power redistribution, "away from entrenched interests to those who have formerly been relatively powerless" (McCool and Guthrie, 2001, p. 320).

It should also be noted though that, as some interviewees explained, the collaborative process behind the *2009 Reef Plan* and *Reef Rescue* did not require the participation of the public in its core objectives. For instance, interviewee RB8 stated that while participation might contribute on raising awareness of the water quality issue in the regions, it does not have any impact on the landholders' decisions to change behaviour. Moreover, being a complex issue that deals with technical specificities such as water pollutants and agriculture management practices to reduce them, it was perhaps redundant to promote participation of less expert actors. However, the 2015 federal government review of natural resource policies stressed that more community consultation was required in setting the outcomes and targets of the plans and policies (Australian Government, 2015c). In this regard, interviewee AI2 said that participation should be included as the plan is based on the citizens' taxes.

Hence, contrary to Daley (2007); Newig and Fritsch (2009); and Biddle and Koontz (2014), who found a positive impact of participation in their studies, this evaluation found a neutral impact of public participation because it was not actually in place. At this point, the literature is not clear about the benefits of including the public in the solution of environmental issues. Ross et al. (2002) argue that there is no strong evidence behind the assumption that high levels of participation are preferable than lower ones. This argument is supported by Buchy and Race (2001), who, in a study of the Australian Landcare program, found little evidence that participation delivered tangible differences

to outcomes. The appropriate role of public participation in environmental policy and planning remains an area of further research.

Competition

Apparently, the competitive process contradicts collaboration as collaborating is more about sharing, while competing is more about gaining advantages. Considering this, it might seem that competition, which is introduced by a market governance approach, would have a negative impact on collaborative governance processes. From the respondent views regarding the assessment of the competitive aspect of the collaborative process, it is likely that it had a negative effect on the water quality outcomes achieved. This is because most of the respondents considered that it contradicted the collaborative approach and was not in their best interest. However, it is important to state these respondents did not view competition as negative *per se*. On the contrary, competition would have been beneficial for the water quality outcomes if it was more efficient. In this regard, the impact of competition was likely to be positive for *Reef Rescue*. This opposition between negative and positive perceived impacts led to a neutral impact of this aspect in the evaluation.

Furthermore, the mixed views by the stakeholders about competition tended to be neutral regarding its impact on water quality outcomes as well as being a complement to the collaborative governance approach. This neutral position was also preponderant regarding competition as representing their best interest. In other words, it seems that the stakeholders were against competing in principle, but supported this mechanism once it was considered as a tool for on-ground implementation. This was based on the belief that competing increased efficiency in the delivery of the water quality plan objectives. There was an ambivalent position in this process that illustrates the tension between competition and collaboration. On the one hand, some of the respondents said that competing was necessary to avoid rent-seeking and ensure quality in the implementation process. Therefore, it was in their interest to compete. On the other hand, some respondents considered that competition created conflict at the regional level of collaboration and countered the collaborative governance approach.

This is the second tension, along with the regulations/incentives instruments, found within the collaborative governance process of *Reef Rescue*. Similar to the regulations, competition was introduced in a top-down manner by higher levels of government. In

this case, competition was required by the federal government who provided the funds for the water quality incentives. Regulations, as stated previously, were introduced by the state government. Regulations appeared to halt the drive of collaboration, while it is unclear if competition facilitated or impeded the achievement of the water quality outcomes.

The theory on collaborative governance does not discuss competition and how it fits with this approach. Hence, there is no benchmark available from the literature review to contrast these findings. Interviewee SG2 explained that competition was adopted by the government following a business approach to natural resource planning where competing is supposed to offer increased investment returns. However, the respondent added that there is insufficient knowledge about its appropriate use on NRM planning in the collaborative setting. For the federal government review, competition for grants undermined the collaboration partnerships, "groups no longer collaborated to the same extent (p. 34)". It also undermined the trust (social capital) that was built previously between the stakeholders (Australian Government, 2015c). This represents another area that requires further research, in order to find out how competition promotes or halts collaboration, as well as how appropriate it is to promote competition within a collaborative governance approach.

7.5 Conclusions

This chapter analysed the impact of collaborative governance on water quality outcomes based on the reasoning that governance processes facilitate (or undermine) the achievement of environmental outcomes; in this case, the water quality outcomes achieved by the *2009 Reef Plan* through *Reef Rescue*. The impact of collaborative governance was examined through a Process-Outcomes governance evaluation framework that combined a series of collaborative governance processes with the water quality outcomes achieved in a period of five years (2008-2013). It is important to note that, contrary to other studies that draw on numerous data samples from multiple case studies to study the impact of collaborative governance on environmental outcomes (Newig and Fritsch, 2009; and Scott, 2015), this research draws on a large case study to explore in-depth this impact.

The benefit of relying on the case study approach was that it allowed identifying how

the governance processes performed. Also, it was possible to highlight the strengths and weaknesses of the collaborative governance approach. In this regard, the study found that the stakeholders perceived a positive impact of stakeholder engagement, learning and decentralisation processes on the achievement of water quality outcomes. The three positive collaborative elements represent the strengths of the collaborative governance efforts behind the implementation of the *2009 Reef Plan*. The coordination and regulations elements were perceived as having a negative impact on the achievement of the water quality outcomes and, therefore, represent the weaknesses of the collaborative approach. The perceived impact of public participation and competition remained unclear and received ambivalent views. As a consequence, the study classified them as having a neutral impact on the achievement of environmental outcomes.

Along with the strengths and weaknesses of collaborative processes identified, the evaluation also identified two tensions within the governance approach: 1) the tension between regulations and incentives to promote land management practice changes; and 2) the tension between competition for funding and collaboration for the achievement of water quality outcomes. These tensions illustrate that collaborative governance was not adopted in a "pure" form. Instead, it was mixed with top-down and market approaches. Hence, the combination of different governance approaches to implement the same plan led to tensions that most likely affected the achievement of the water quality outcomes. This means that, in practice, there needs to be awareness among the actors involved that there is no pure collaborative governance. Different governance approaches occurred within the collaborative governance setting, such as hierarchy (regulations) or market mechanisms (competition). This study contributed in identifying the tensions among the governance of water quality in the GBR, which provides valuable information to the decision-makers in the challenge of selecting a more appropriate mix of governance approaches to achieve the environmental outcomes.

Additionally, the chapter showed the absence of a cause-effect relationship between governance and outcomes (social, environmental or economic). On the contrary, there is an indirect relationship between governance and outcomes, where the first represents a driver rather than a cause of the latter. Addressing the weaknesses of the collaborative governance effort might contribute to facilitate a better achievement of environmental

outcomes. However, this would not necessarily lead to achieving the original targets of the plan or policy. Therefore, apart from governance, other variables are also involved in the solution of environmental issues, which illustrate the degree of complexity of the water quality issue. Based on the process-outcomes governance evaluation framework (Figure 7.11), these variables refer to funding amounts available as well as external factors (which were also identified in the previous chapter), such as land area, land-uses, market shifts, weather events as well as the socio-political context of the case studied.

The examination of the processes-outcomes was based on the views of key stakeholders that were involved in the implementation of the water quality plan. These stakeholders rated a series of statements that referred to seven collaborative governance processes: stakeholder engagement; coordination; regulations; public participation; learning; decentralisation; and competition. The focus on a single case-study limits the generalisability of this study's findings to different social and environmental contexts. They remain comparable in a national context. However, the use of an evaluation framework combining governance processes and outcomes can be applied internationally and in other planning and policy domains, not only for environmental issues.

Additionally, this examination is limited to the perceptions of the stakeholders, which do not form a larger sample as only some of them were involved in *Reef Rescue* and the *2009 Reef Plan*. As this study represents an examination of past events, some of the people directly involved have moved to other jobs. Nonetheless, the perceptions are compared with the actual data on water quality outcomes, which adds robustness to the evidence around the impact of collaborative governance on environmental outcomes. The next chapter builds on these significant findings to develop a synthesis of all the findings in the research, and discuss in more detail the implications of this study on the impact of collaborative governance on environmental outcomes. The next chapter also addresses the fourth and final research sub-question of this study, highlighting future directions (along with recommendations) for collaborative governance research within environmental policy and planning, based on the findings of the case study analysis.

CHAPTER 8: SYNTHESIS AND CONCLUSIONS

8.1 Introduction

> Governance is important. Understanding how societies attempt to control their economies and societies, and how they do so in a more or less democratic form, is crucial for understanding the quality of life for the citizens of countries (Peters, 2016, p. 316).

At its core, governance is concerned with improving quality of life. A fundamental aspect that enhances our life quality is the condition of the environment. In the attempt to grasp how societies attempt to control their economies and societies to influence quality of life, this study focused on the environment and one of its main resources, water. In the above statement by Peters, I would add the quality of life, not only of humans, but also of other living beings as this study considered the impacts of governance on the water quality of a marine environment, which sustains marine life and, indirectly, human life through economic and leisure activities. When considering quality of life from an environmental perspective, the condition of the environment reinforces the quality of life of citizens, but this is more complicated to understand as, contrary to economic development, the improvements on the overall quality of life as a result of healthy environments occur in the long-term.

This section discusses the ways that collaborative governance impacted on water quality in the GBR to understand the importance of governance in the attempt to control an economic activity (agriculture) and a society (the NRM regions in the GBR) towards achieving better environmental conditions. Improved environmental conditions translate into better quality of life for humans and other beings. In the case of the GBR, its environmental condition determines the quality of social and economic benefits, such as income or enjoyment for the communities along the GBR's regions (GBRMPA, 2014). Therefore, governance is important because it contributes to the quality of the environment and, as a consequence, on the quality of life of a given country. The focus on environmental outcomes (e.g. achievement of better environmental conditions) represents a pragmatic evaluation of governance that leaves aside the examination of democratic standards. The purpose of this chapter is to synthesise the findings presented in previous chapters and highlight their implications for governance research and practice in environmental policy and planning. To frame this discussion, I re-

consider the main research question and sub-questions presented in the Introduction (Chapter 1). I elaborate on the significance of these findings using related literature and the conceptual governance evaluation framework to expand into *what* and *how* we can learn about the evaluation of governance in the complex natural resource planning and management areas.

It is worth noting that examining governance, its processes and its impact on outcomes, contributes to clarifying the vagueness that usually accompanies the concept and practice of governance. The general fuzziness of governance has already been discussed by previous scholars. For instance, Peters (2016) argues that the vague nature of the term and practice of governance runs the risk of finding governance everywhere. Hence, governance would seem to express a similar logic stated by Wildavsky (1973) for planning, in the sense that if governance seems to be everything, then maybe it's actually nothing. To show that governance is in fact 'something', I adopted an established definition of collaborative governance provided by Ansell and Gash (2008) in their seminal work about the concept and practice of collaborative governance (Chapter 2).

Then, I analysed the impact of collaborative governance on outcomes (environmental outcomes in this case) as a way of delimitating an area of influence of governance. Subsequently, the identification and assessment of the governance processes (collaborative governance criteria developed in Chapter 4, Table 4.4) within the area of influence showed where governance was taking place and what type of impact it had on water quality outcomes. This clarification of governance by delimiting its role and area of influence, identifying its processes and showing its impact on environmental outcomes contributes to a better understanding of governance practice.

The chapter proceeds in this order. First, I focus around the key findings of my study to discuss about the impact of collaborative governance on environmental outcomes in Australian natural resource planning and management. The key findings section is divided in three sub-sections, framed by the three case study research questions. In the first one, I focus on the role of collaborative governance in the implementation of the *2009 Reef Plan*, discussing about the governance arrangements behind the water quality planning effort. In the second sub-section, I discuss the impact of collaborative governance on water quality outcomes at the regional level (where the implementation efforts were concentrated), highlighting that collaboration made a positive difference in

the achievement of water quality outcomes. In the third sub-section, I discuss about the strengths and weaknesses of the overall collaborative governance approach in the *2009 Reef Plan*, based on the application of the Process-Outcomes governance evaluation framework. In the second section, I present the implications of this study based on the key findings discussed, framed by the fourth research question. I also include a series of recommendations for policymakers and planners. In the third section, I present the limits of this study and summarise the further research areas that were identified in previous chapters. In particular, I emphasise the need to further study governance aspects and roles in order to improve environmental policy and planning. Finally, I offer a brief recapitulation of the research and its significance.

8.2 Key findings

8.2.1 The role of collaborative governance: limited but mildly beneficial

To find out about what difference collaborative governance made with respect to the environmental outcomes achieved, I focused first on its role in the implementation of the *Reef Plan* through the first research question: *What was the role of collaboration in the implementation of the* 2009 Reef Plan*?*

In the case-study analysis, I found two main things: 1) collaboration at the regional level was perceived as essential because without it, it is highly likely that no water quality outcomes would have been achieved; and 2) collaboration had a limited scope as it was confined largely to the regional level and, compared to theoretical notions, it lacked more participatory and deliberative components. The first aspect, the essential role of regional collaboration, implies that the actors of the water quality plan acknowledged regionalisation[7] and collaboration as the most appropriate approach. Collaboration introduced a different way of doing things that had a perceived overall positive impact at the regional level, as one actor pragmatically observed:

> This was the first time in terms of Reef investment or Reef intervention that we actually had multiple stakeholders actually trying to work together. It certainly wasn't perfect by any stretch, but at least we had industry, we had NRM on the same page, and working towards the same goals. It is the first time it happened at that scale, whole of Reef (extract from

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[7] Regionalisation, as mentioned in Chapter 5, refers to the devolution of responsibility to the regional level for the delivery of NRM and planning. It involves a territorial decentralisation for environmental policy and planning tasks in which, nonetheless, central governments still retain control of the regional processes.

Chapter 7, p. 174).

This essential role attributed to collaborative governance was reinforced by the fact that collaboration has been the approach followed in subsequent water quality plans for the Reef, from 2013 and onwards. In this respect, collaboration has become, for pragmatic rather than democratic reasons (more 'what-gets-things-done' than 'what-gets-things-more-equal' view), the foundation to govern the GBR. However, due to this pragmatic view, collaboration had a limited scope as it was marginal at upper levels of governance and the collaborative approach had no larger deliberative or participatory ambitions. In this regard, it resembled more what Ansell (2012) denominates 'narrow' collaboration, which is used as a technique to solve conflict and promote cooperation between stakeholders, than 'ambitious' collaborative governance.

The ambitious modality of collaboration, as Ansell explains, deepens participation and deliberation in public affairs, contributing to reconstruct democracy. This would lead to stronger engagement processes that would be more durable, fairer, robust and efficient (Emerson et al., 2012). In the Australian context, Curtis et al. (2014) argue that effective collaboration requires inclusive deliberation processes. There was no sense of this ambitious collaboration in the collaborative approach of the *2009 Reef Plan,* which could be seen in three important aspects: 1) lack of deliberation by stakeholders in funding allocation and definition of water quality targets; 2) lack of public participation in the overall scheme of the plan; and 3) exclusion of the local governments from the collaborative governance arrangements.

The above three aspects point out to an unwillingness of sharing spheres of power by the central governments. Hence, the collaborative approach studied confirms what Cheshire et al. (2007) and Bell and Hindmoor (2009) have stated previously, about the limits of collaborative or participatory governance processes, where central governments retain control and ability to determine the path of the policy, despite official rhetoric about partnerships or joint government. Taylor (2010) found the same limited approach to collaboration in Australian environmental governance. The pragmatic and narrow approach to collaboration adopted for water quality planning though, achieved mild improvements in water quality (see water quality outcomes achieved in Table 7.4, Chapter 7), showing that collaboration was not only about 'talk and no action', as argued by Lubell (2014). Scott (2016) also found that collaboration actually led to actions in his study about water quality improvements in the US.

The limited role of collaboration can also be explained through the governance arrangements of the GBR water quality scheme. As shown by Figure 6.2 in Chapter 6, collaboration did not occur in a 'pure' form. It was mixed with hierarchical (top-down) and market governance approaches. In this regard, it is rare that a governance approach occurs in a 'pure' form as it is usually combined with other governance approaches (Meuleman, 2008); and in Australia it adopts a 'hybrid' form of top-down and bottom-up approaches (Lockwood and Davidson, 2010). For collaborative governance approaches, this 'impurity' in their arrangements has been identified by Emerson et al. (2012); Lemos and Agrawal (2006); Koontz et al. (2004); and Scott and Thomas (2017). The governance arrangements, classified as 'high' and 'regional' collaboration, also illustrate the limited scope of collaboration, confined mostly at the regional level, where NRM groups are the main actors. Figure 8.1 presents a modified version of the governance arrangements, including the governance approaches used at each level to illustrate the 'impure' form that collaborative governance adopted. Based on Rhodes (1996) and Jessop's (2011) classification of three main governance approaches, (A) denotes a hierarchical governance approach; (B) refers to market governance; and (C) refers to collaborative governance, which is the type of network governance approach analysed in this thesis.

The 'high' collaboration domain was composed by the federal and state levels of governance, in which non-state actors such as the international conservation NGO and peak industry bodies participated. The relationships between the state and non-state actors within this collaborative domain followed a (C) approach. However, the state and federal levels relied on (A) towards the regional domain of collaboration. However, the state and federal levels relied on (A) towards the regional domain of collaboration. This top-down control by federal and state governments confirms what was stated above regarding the limited sharing of spheres of authority between the levels of governance that occurs in network or collaborative governance approaches.
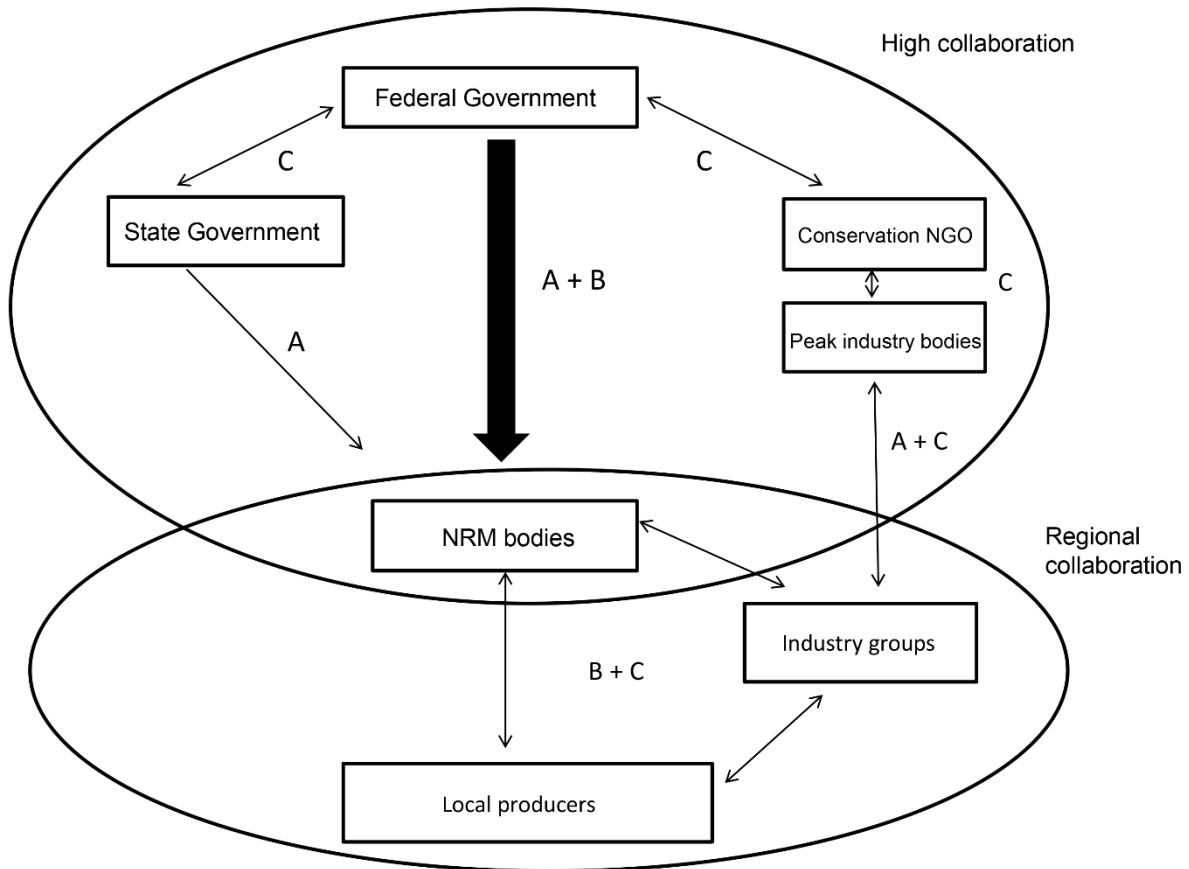
Figure 8.1 Governance arrangements of the *2009 Reef Plan*, indicating the governance approach followed by each level of governance in the Reef Plan. A=hierarchy; B=market; and C=collaboration (source: prepared by author).

The federal government combined (A) with (B) by providing incentives to the regional actors, which were administered by the NRM bodies. (B) was also expressed in its regionalisation strategy of devolving responsibility to the regional level, in which it followed market notions of efficiency by using lower levels of governance (given its close proximity to the environmental issues), as instruments for more effective implementation. The use of (A) by the state government was expressed in its use of regulations. The Figure shows a collaborative approach (C) between the state and federal governments. However, the collaboration between these levels was minimal and, at times non-existent, as demonstrated by the lack of consultation between the two levels regarding the introduction of regulations.

The lack of collaboration between state and federal levels in Australian environmental policy and planning responds to structural constraints of its political system. Within this system, the state level has a high degree of autonomy as it has constitutional powers

over its natural resources. The participation of Australian states and territories in federal water quality policies is voluntary (Robins and Kanowski, 2011). The poor collaborative ties between federal and state levels also responds to a weakening of the state-federal partnership that supported initially the regional model of governance. This was a result of the more centralised 2008-2013 CfoC program, in which the *2009 Reef Plan* was embedded. In this regard, the governance arrangements of the *2009 Reef Plan* are an example of the languishing collaborative ties among state and federal governments. This has been highlighted as a governance issue by Curtis et al. (2014); Robins and Kanowski (2011); and Vella et al. (2015).

At the regional collaboration domain, where collaboration between the regional actors was decisive for the achievement of the water quality outcomes, this approach was mixed with (B) approaches. (B) was seen by sub-contracting engagement services from the NRM bodies to the industry groups as well as the competitive grants processes used by the NRM bodies to allocate water quality funds to local producers. An important thing to note in this regional domain of collaboration is that the local governments were excluded from the *2009 Reef Plan* scheme. This represents another example of 'narrowed' collaboration, which did not have inclusion within its core objectives.

What strikes the observer when inspecting closely regional collaboration in the *2009 Reef Plan* is that, at times (and despite the stakeholders' perceptions), regional on-ground implementation became more a market approach than a collaborative approach, as it relied on competition and sub-contracting strategies to change the behaviour of local producers, which were the target group of the policy. Collaboration, in this sense, resembled more a business approach of service delivery. This was reinforced by the federal government's policy of providing incentives through regionalisation, using the regions as vehicles for service delivery, confirming the predominant neoliberal ideology behind the natural resource planning and management efforts, identified by Lockwood and Davidson (2010). Moreover, Curtis et al. (2014) argue that the focus on environmental outcomes promoted by CfoC (rather than other outcomes, such as improving knowledge or building trust), led to emphasising market governance. This contradicts the official rhetoric that tends to highlight only the collaborative approach behind the implementation of *2009 Reef Plan* (Australian Government, 2011; and Australian Government, 2014a), leaving the impression that water quality planning was all about collaboration.

Returning to Peter's (2016) quote in the Introduction of this chapter, about the importance of governance: analysing the role of collaborative governance represents the first step towards explaining how state and non-state actors attempted to control agriculture and NRM regions to improve water quality in the GBR. In this sub-section, I showed that collaboration was narrow, and its impact was limited and complicated by the combination of market and top-down governance approaches within the collaborative framework of the *2009 Reef Plan*. The next sub-section discusses about the impacts of regional collaboration on regional water quality outcomes in the GBR, as the next step in explaining the significance of the collaborative approach in improving water quality conditions and, by extension, life quality.

8.2.2 Impact of regional collaborative governance: moving beyond uncertainty

For the second step in the analysis of collaborative governance and its importance (based on the environmental outcomes achieved), I focused on the most immediate scale of implementation, in which the outcomes were produced. In this sub-section, I 'zoom in' into the regional collaboration domain of the collaborative governance arrangements (Figure 8.1). As stated in the Introduction (Chapter 1), focusing on the appropriate governance scale is fundamental to provide a better understanding of the impact of governance on environmental outcomes. In this case, I selected the regional scale as it was the scale where on-ground implementation of the *2009 Reef Plan* occurred. Moreover, the stakeholders of the policy identified the regional governance scale as the essential one and the scale where water quality outcomes were produced. The main purpose of analysing the regional scale was to contribute in reducing the uncertainty among the relationship between collaborative governance and environmental outcomes. Hence, I focused on the following research question: *How regional collaborative governance approaches impacted on environmental outcomes achieved by the NRM regions of the GBR?*

In the analysis of the six NRM regions, I found that: 1) there was a positive tendency between the existence of coordinators in the NRM bodies to engage with the local producers, and the achievement of better water quality outcomes; 2) funding for on-ground delivery[8] was not as significant as expected in determining the achievement of

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[8] By funding for on-ground delivery, I refer to the water quality grants offered by the federal *Reef Rescue* program as incentives to change land management practices. The grants were administered by the NRM bodies, which allocated them through competitive processes among the local producers.

water quality outcomes; and 3) context and external factors play a significant role in the link between collaborative governance and environmental outcomes. This confirms the view that governance is more an indirect than direct driver of outcomes.

In the first finding, the use of the coordinators proxy indicator of collaborative governance clarifies to some extent the different impact of regional collaborative governance on the water quality outcomes achieved per NRM region. In general, the regional collaborative governance approaches of the NRM bodies consisted in either collaborating directly with the local producers to change land management practices and reduce land pollutant runoff, or in sub-contracting this task to regional industry groups who worked with the local producers to introduce land management changes. At the regional level, the NRM bodies were the central actor and hence, the analysis focused mostly on them.

The coordinators proxy variable became a tangible element of each 'operational' collaborative effort that allowed identifying a relationship between collaborative governance and environmental outcomes. In this case, it contributed in reducing the uncertainty that usually pervades the relationship between collaborative governance and environmental outcomes. This is an uncertainty previously noted by Koontz and Thomas (2006); Mandarano (2008); and Newig and Fritsch (2009). The analysis suggests that regional collaboration had a positive impact on water quality outcomes through the role of coordinators (or facilitators) that promoted change in land management practices amongst local producers. This coincides with Scott (2015), who also found a positive tendency — in a series of US watershed councils — between having coordinators and improved water quality outcomes. Moreover, this suggests, as I stated in the second finding, that collaborative approaches were more important than funding for on-ground delivery in the achievement of water quality outcomes. This is seen through the fact that regions with more coordinators, but less funding, achieved better water quality outcomes (Figure 6.13, Chapter 6). This contradicts the positive relationship between increased on-ground funds for delivery and improved water quality outcomes found by Scott (2016).

Nonetheless, this does not mean that there is a correlation (cause-effect relationship) between coordinators and improved water quality outcomes. It only suggests that there appears to be a positive contribution of coordinators, which are a function of the collaborative approach. Hence, there appears to be a positive contribution of

collaboration on water quality outcomes, which by no means is conclusive. In Australia, so far and to my best knowledge, a similar analysis about the impact of regional collaborative governance on environmental outcomes has not been undertaken. This means it is not possible to compare what I found with other Australian cases.

On the other hand, the regional collaborative approaches — in which the coordinators variable represent a function — reflect the 'impurity' of the collaborative governance arrangements. As noted in the previous section, regional collaboration was mixed with a market governance approach. As I pointed out in Chapter 6, in some cases the coordinators' positions were sub-contracted to agriculture businesses. This fits with Emerson et al. (2015) and Scott and Thomas (2017) view of collaborative governance as a 'toolbox' to solve public issues. Market mechanisms such as contracting services are part of the collaborative 'toolbox'. In this view, collaborative governance includes common policy tools, such as regulations, partnerships or contracts. This provides another hint to the limited impact and role of collaboration found in this study, as the inclusion of tools from other governance approaches resembles an expanding umbrella that, nonetheless, cannot manage to cover all the damp areas.

The mixed governance approach between market and collaboration represents also an example at the regional level of what Curtis et al. (2014) noted about the effect that focusing on environmental outcomes had on governance of the national CfoC program: a predominance of market governance. By shifting the perspective from impact-of-collaboration-on-environmental-outcomes to impact-of environmental-outcomes-on-collaboration, it can be seen that the focus on achieving outcomes altered the collaborative approach by relying on market mechanisms of governance.

Moreover, the focus on environmental outcomes seems to have weakened the emphasis on collaboration in favour of more business-style strategies, based more on contracts than on relationship-building. This impact on regional collaboration (moving to an emphasis on market mechanisms) was not noted by official rhetoric or by the stakeholders that participated in this research. This also explains why collaborative governance, despite the positive contribution of coordinators, was also limited at the regional level, following the same pragmatic view of collaboration found in the first research question. This was also reinforced by the weak collaborative ties between the NRM regions of the GBR, which were highlighted in Chapter 6.

The limited (but mildly beneficial) impact of regional collaborative governance on water quality outcomes is better understood when comparing the water quality targets of the *2009 Reef Plan* and the outcomes achieved (Table 7.4, Chapter 7). The collaborative approaches of each NRM region (distinguished by the coordinators variable) partially explain the impact of regional collaboration on water quality outcomes. This illustrates that environmental governance capacity, in the form of regional collaboration, is necessary to achieve environmental outcomes (Chapman, 2014). The other part of the explanation is provided by context and external factors, which play a significant role in outcome achievements. This represents the third finding of the regional scale analysis, framed by the second research question. As I mentioned in Chapter 4, it is important to incorporate contextual conditions in the analysis of how governance impacts on environmental outcomes. Context and external factors show that collaborative governance is not applied 'uniformly'. This depends not only on the multi-governance setting, but also on the different contextual conditions and capacities of the regional organisations responsible of implementing the plan or policy.

Context is given by the nature of the water quality problem in each of the six NRM regions of the GBR. The water quality issue per region was distinguished according to population, land sizes and uses, as well as contribution of pollutant loads in the Reef catchment (see the typology of NRM regions, Tables 6.2, 6.4 and 6.5, Chapter 6). Even though the six NRM regions faced different water quality issues, such as some having large land grazing areas (Burdekin and Fitzroy), and others having small sugarcane areas (Mackay Whitsundays and Wet Tropics), they were held to the same water quality targets by the *2009 Reef Plan*. This relates with the inappropriate project selection of the plan, pointed out by the stakeholders. Project selection is part of staff skills, identified as a key external factor within the implementation of the plan (Table 6.9, Chapter 6). An important consequence of not taking the context into account was not being able to identify the areas with most impact on water quality, the so-called 'hotspots'. As one actor form the agriculture sector explained:

> "Reef Rescue was just blanket, from my understanding it was just investment all around, so not necessarily where you really need it to put all the investment to get the best outcome... and there were components were maybe they've been funded for things that weren't having a great or the best public benefit, more of a private benefit."

The inappropriate project selection was also highlighted by an evaluation report on

management effectiveness of the GBR (Hockings et al., 2014). In addition, applying the same water quality targets for all NRM regions represents another example of the limited role of collaboration within the mix of other governance approaches, as the targets were defined by the central government in a hierarchical way.

Apart from the nature of the water quality problem understood through the typology of NRM regions[9], governance structures of the NRM bodies were the other contextual element (Table 6.8, Chapter 6). Although similar in general, the governance structures reflect different implementing capacities of the NRM bodies, which are also related with the different regional water quality outcomes achieved. What was surprising in this regard was that, regardless of funding, regions with less capacity[10] (as rated by Robins and Dovers, 2007a) achieved better water quality outcomes (Figure 6.12, Chapter 6). Coincidentally, these regions also had more coordinators available to implement the plan, which reinforces the positive impact of regional collaboration.

Context was complemented with external factors to the collaborative approaches. Among these main factors was funding for on-ground delivery. According to the second finding of this section, this type of funding appeared less significant than the regional collaborative approaches in the achievement of water quality outcomes. However, this does not mean that funding is not important. It only means that it should be allocated differently. Apart from staff skills mentioned above, data standards were another key external factor influencing the implementation of the *2009 Reef Plan*. Both are interrelated and can be considered more as internal factors as they form part of the internal composition of the NRM bodies. It is worth noting that data standards may have had a significant influence in the final water quality outcomes reported by each region to the federal government. Moreover, data standards probably contributed in reflecting the differences in water quality outcomes achieved, as each NRM body followed different methods to report their achievements. It might be possible that NRM bodies with higher staff skills were able to apply more sophisticated data standards that reported better water quality outcomes. As one regional actor explained:

"The rigour in which that was done, that was done by the project officers that were working

[9] The typology of NRM regions in the GBR represents a novel element in the analysis of governance of the GBR. To the best of my knowledge, there have not been similar attempts at typifying the different contexts of NRM regions within the GBR.

[10] The capacity of the NRM regions was ranked according to access levels to resources (e.g. research, finances, and infrastructure), population numbers, and priority levels in federal water quality policies.

on the project within the region, and there's different quality of that data. So, generally it's ok, but it's really, I know that there was a lot of over-reporting, no sorry, not a lot, there was over-reporting."

Hence, the lack of 'uniformity' in implementing the collaborative approach is also seen through divergent data standards followed by the NRM bodies. This also points out to monitoring and reporting issues. There were other external factors influencing implementation, such as weather events (e.g. floods and cyclones) and market shifts (e.g. international price changes); however, their impact stood more aside of the NRM bodies' internal structures.

Surprisingly, the stakeholders did not mention politics (e.g. impact of politicians' decisions or political 'lobbying' in NRM and planning) among the external factors, despite its implicit importance in collaborative processes (Wondolleck and Yaffee, 2000). Perhaps, stakeholders did not mention politics in order to avoid controversy. For example, they did not discuss about issues with other regions or enter into comparisons about their efforts, even though it was accepted that different funding amounts led to resentments between regions. This also contributes to explain the poor cross-regional collaboration during the implementation of the *2009 Reef Plan*. On the other hand, the analysis of the impact of politics on the relationship between collaborative governance and environmental outcomes has not been considered by previous literature and stands out of the scope of my study.

In summary, coordinators had a positive trend associated with the achievement of better water quality outcomes. The coordinators proxy variable also contributed in distinguishing between the collaborative approaches followed by the regional NRM bodies. The positive association between having coordinators and achieving more pollutant reductions partially explains why NRM regions with less funding achieved better water quality outcomes. This reinforces the view that governance acts more as an indirect driver of outcomes. Apart from regional collaboration, context and external factors complement the explanation of achieving better water quality outcomes despite more or less funding. For contextual purposes, the water quality issue was not the same in each of the six NRM regions. However, in the *2009 Reef Plan* the regions were subjected to the same water quality targets. Regarding external factors, a key finding was that funding for on-ground delivery does not necessarily leads to achieving better water quality outcomes. Additionally, staff skills interrelated with data standards (aside

of coordinators) had an important contribution in terms of variances in water quality outcomes achieved. They represent direct drivers of outcomes.
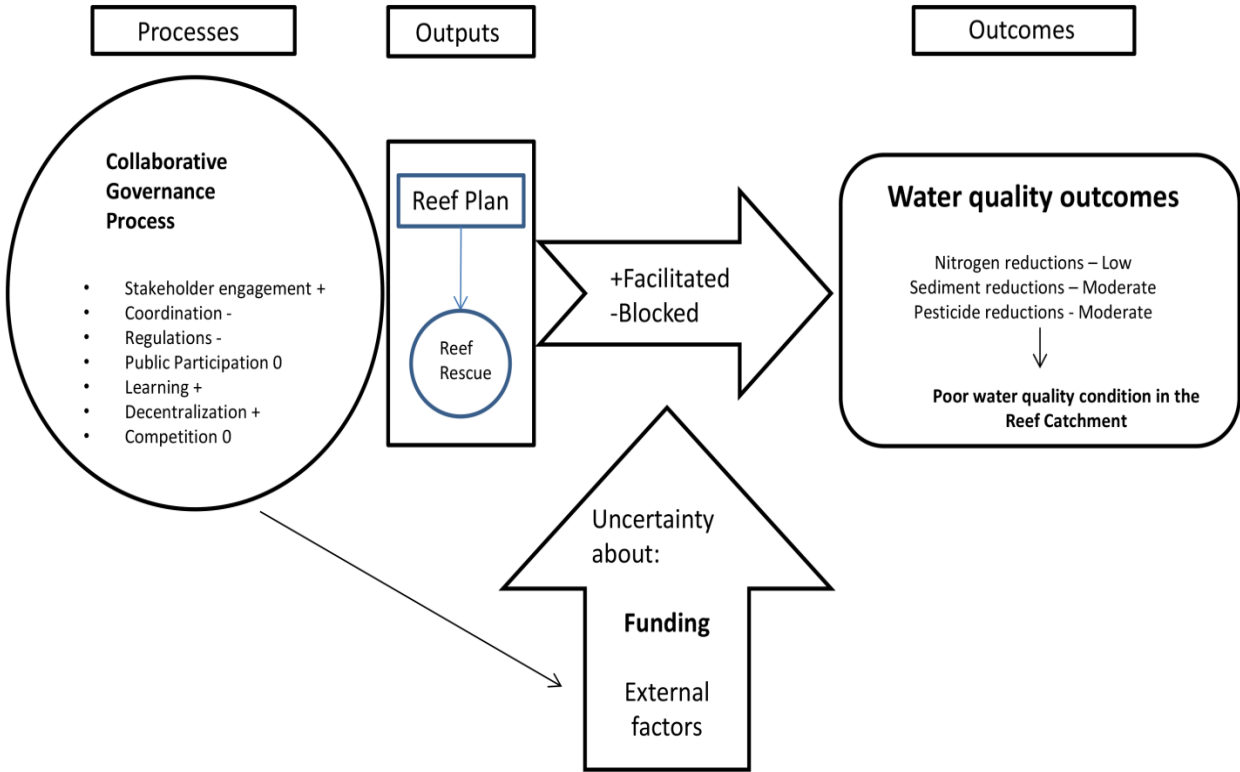
This analysis of collaborative governance at the regional scale represented the second step in explaining — following Peter's (2016) quote on the importance of governance — how agriculture and the NRM regions were governed through collaboration to improve water quality. In this sub-section, I suggested that regional collaboration had a positive impact on the water quality outcomes achieved. I also contributed in clarifying the relationship between regional collaborative governance and environmental outcomes, reinforcing the argument that governance is an indirect driver of environmental outcomes. In this regard, it is essential to take into account other variables apart from governance, such as context and external factors to understand the environmental outcomes achieved. The next sub-section discusses how the overall collaborative processes (incorporating all the other governance levels) impacted on the water quality outcomes achieved by the *2009 Reef Plan*.

8.2.3 Process-Outcomes governance evaluation of collaboration in the GBR: mixed impact and tensions

In this sub-section, I 'zoom out' from the regional scale presented in the previous section to a wider scale, which includes the high collaboration domain of collaborative governance arrangements (Figure 8.1). The purpose of this 'zooming out' is to cover all governance levels in the discussion about the overall impact of collaborative governance on water quality outcomes of the *2009 Reef Plan*. This represents the third step in the analysis of collaborative governance and its contribution in achieving environmental outcomes. The discussion is framed by the Process-Outcomes governance evaluation framework (Rauschmayer et al., 2009) to focus on the third research question of this study: *What are the strengths and weaknesses of the collaborative governance approach?*

Through the application of the Process-Outcomes governance evaluation framework, I found that: 1) collaborative governance processes had a mixed impact, some facilitated while others blocked the achievement of water quality outcomes; and 2) this mixed impact of collaborative governance responds to the mixed or 'impure' condition of the collaborative approach, which created tensions between regulations vs incentives, and competition vs collaboration.

The first finding offers a glance inside the 'circle' of collaborative governance processes of the *2009 Reef Plan* (Figure 8.2 below, also shown in Chapter 7). This analysis contributed to reduce the vagueness around the practice of governance, mentioned in the Introduction of this chapter. This represented another way of showing that governance is 'something', a process of steering and coordinating through different tools the achievement of goals behind an environmental planning effort. So far, and to my best knowledge, previous research within Australia had not assessed the collaborative processes and its impact on environmental outcomes. The identification of these processes was based on a review of collaborative governance criteria developed in Chapter 4. Therefore, a key contribution of this research was to open the 'box' of collaborative governance through the use of the Rauschmayer et al. (2009) framework, and find out how its different processes impacted on water quality outcomes. One of the main implications of this governance analysis was to make explicit how collaborative governance represents an indirect driver of water quality outcomes, either by facilitating or blocking their achievement.

Figure 8.2 Process-Outcomes governance evaluation framework with the results from the case study analysis of the GBR, adapted from Rauschmayer et al. (2009).

The (+) sign indicates a positive impact of the collaborative governance process, while (–) indicates a

negative impact, and (0) a neutral impact. The overall consequence was a poor condition of water quality in the GBR catchment after the collaborative governance planning intervention.

The mixed impact of collaborative governance coincided with the same mixed impact found in the review of Chapter 4. In both, different elements of collaboration (identified in the collaborative governance 'circle' of Figure 8.2) had either a positive, neutral or negative impact on environmental outcomes. The positive elements were seen as facilitating achievement of outcomes, while negative elements were viewed as blocking them. Neutral elements did not have a clear impact. As shown by Figure 8.2, stakeholder engagement, learning and decentralisation facilitated the achievement of outcomes, and represent the strengths of the collaborative governance approach. Competition and public participation had a neutral impact on water quality outcomes, representing elements that could become strengths of collaboration. Coordination and regulations blocked the achievement, representing the weaknesses. Stakeholder engagement validates the pragmatic approach adopted for collaboration, in which stakeholders engaged to implement the plan and inform about its progress, devoting limited time and space for negotiations or deliberations. The positive impact of stakeholder engagement was also found by Vella et al (2017) in their unpublished report on the evaluation of Queensland regional NRM arrangements, which included the 14 regions of the state. Collaboration was functional but not inclusive, as stakeholders accepted that power differences and access to resources limited the scope of engagement and, in consequence, the achievement of water quality outcomes. This view was synthesised by a regional actor:

> "There were certainly differences in power and access to resources… If you're talking about an outcome in terms of engagement and feeling empowered, and that sort of thing as it is… Then yes, it probably did have an outcome, it probably did have a negative outcome."

The process of learning, particularly of knowledge sharing, represents the second strength, confirmed by improved collaboration and water quality outcomes achieved in comparison with the 2003 Reef Plan, as well as subsequent plans for water quality that rely on collaboration (Australian and Queensland Governments, 2013). Contrary to what Curtis et al. (2014) argue about the CfoC (where the *2009 Reef Plan* was embedded) that focused more on a business approach than on learning or building trust, the stakeholders interviewed felt that they learned from past planning experiences. As one regional actor stated, reflecting on the legacy of the *2009 Reef Plan* and *Reef Rescue*

in their present efforts (which confirms also the essential role of regional collaboration):

> "Trust is not really a thing to improve as it is something that the NRM group has worked with the industry in the past eight years (referring to the process started by the *2009 Reef Plan*). The NRM group now has trust on the agriculture industry and that is why the industry is responsible of delivering the program."

Learning was also identified as a strength by Vella et al (2017) evaluation of general regional NRM arrangements. The authors highlight especially the capacity of the NRM bodies in Queensland to gather knowledge from multiple sources (i.e. scientific, indigenous and policy), playing the role of "knowledge brokers". Decentralisation represented the third and final strength of collaborative governance. This shows that the regionalisation strategy of devolving responsibility to the regional level for plan delivery has had a positive impact. Regardless of its limited sharing of power, the decentralising process involved in the collaborative approach was perceived as beneficial for achieving water quality outcomes. This confirms Robins and Kanowski's (2011) finding on decentralisation as being the preferred approach by stakeholders to implement NRM and planning. It also coincides with the positive impact of decentralisation in the GBR context found by Taylor and Van Grieken (2015).

Competition and public participation were neutral, as they did not have a perceived impact on water quality outcomes. Given the predominance of neoliberal ideology in Australian water quality planning and management (mentioned in the discussion of the first research question), competing for funding or other resources in collaborative governance was perceived as largely normal by the stakeholders. Hence, it became in their view a neutral process. Public participation was also considered neutral as the stakeholders perceived it was not part of the plan. The lack of public participation (as argued in Chapter 7) supports the limited role of collaboration found in the first research question, as the public (e.g. citizens of regional communities) was not involved in the collaborative processes. This also contradicts the findings by Vella et al (2017) –at least for the NRM regions of the GBR that plan and manage water quality− who considered that participation was consistent along the governance arrangements of Queensland NRM regions. Additionally, given the mixed governance approaches within collaborative governance, this shows the paradox of participation, where hierarchy and network approaches such as collaboration, have not been effectively combined to promote public participation (Curtis and Lockwood, 2000). The weaknesses of the collaborative

approach are represented by coordination and regulations. Coordination has been highlighted as a persistent governance challenge of natural resource management and planning, mainly due to the Australian multi-level governance setting (Morrison et al., 2004; and Peterson et al., 2010).

Regulations, along with competition, link with the second finding of this section, regarding the tensions found in collaborative governance: regulating while providing incentives; and collaborating while promoting competition. The tensions respond to the 'impure' condition of collaboration previously highlighted, in which other governance approaches such as hierarchy (regulations) and markets (competition and incentives) interact. This fits with Beck's (1992) concept of 'second modernity', where he sees social evolution characterised by tense relationships between contradictory phenomena that coexist and even need each other. Within this logic, for example, "both strong leadership and decentralised ownership are needed" (Meuleman, 2015, p. 12301). Furthermore, Lockdown and Davidson argue that 'pure' modes of governance are poorly equipped to respond to the complexity and multi-scalar character of coupled social and natural systems" (2010, p. 388). However, as this study shows, 'impure' governance approaches can also lead to tensions that contribute in blocking the achievement of water quality outcomes. The tensions found are also inherent to governing at multiple scales (Ansell and Torfing, 2015). In this case, apart from the regional scale, the collaborative effort included national, state and local scales.

For instance, regulations promoted fear and unwillingness to collaborate from the local producers, the target group of the plan, while competition contradicted the collaborative nature of the *2009 Reef Plan*, excluding potential participants that could not compete with larger producers. It is important to note, though, that these tensions were not perceived as negative *per se* by the stakeholders. On the contrary, regulations and competition were viewed in principle as beneficial to the collaborative approach. The stakeholders only considered that they required adjustments to have the desired effect on water quality outcomes. An actor from the federal level exemplified this position, regarding the tension between incentives and regulations:

> "The two things (incentives and regulations), they should've worked side by side, with the voluntary approach targeting one section of the industry, the regulatory approach targeting a different segment of the industry, but yeah, the way regulations were rolled out, it was really, it was really challenging… There wasn't enough consultation in my opinion, and so

they came as a big surprise and yeah, everybody was pretty angry."

This supports Ansell's (2012) argument about the need to have regulations to underpin collaborative governance, but with the essential requirement of developing them collaboratively. This tension also responds to the poor collaborative ties between the federal and state governments mentioned in the findings of the first research question. With regards to competition, this was a unique element of the collaborative approach of the *2009 Reef Plan*; hence, there are no studies to compare its impact. The stakeholders involved in this study generally considered that competition complemented collaboration as it promoted efficiency, but were not clear about the ways to design this element to achieve a beneficial impact on water quality outcomes. This view was illustrated by one actor from the state level:

> "The common wisdom of government investment (in NRM) is taken from the commercial world, where competition is, usually, gets you the best price. But I don't know enough to know whether that's well translated into natural resource management working in that collaborative setting with farmers."

Reconsidering Peter's (2016) quote, this section represented the third step in explaining the attempt to control through collaboration an economic activity (agriculture) and a broad society (NRM regions) to improve water quality in a key Australian ecosystem (the GBR). I showed that collaborative governance had a mixed impact on the achievement of environmental outcomes, similar to the one found by other studies (Chapter 4). Through the examination of collaborative processes, I was able to indicate which ones facilitated and which ones contributed in blocking the achievement of water quality outcomes. In this way, I made explicit the ways in which collaborative governance drove indirectly the achievement of environmental outcomes. In addition, I indicated explicitly the tensions (regulations versus incentives, and collaboration versus competition) created by the combination of hierarchy and market approaches within the collaborative governance arrangements of the *2009 Reef Plan*. The next section discusses the implications of the impact of collaborative governance on environmental outcomes, and offers a set of recommendations based on the findings discussed in these sub-sections.

8.3 Directions for collaborative governance in Australian environmental policy and planning: from governance failure to metagovernance

In this section, I focus on the implications of the findings discussed in the Key Findings, Section 8.2. This represents the fourth and final step in analysing the significance of collaborative governance for the achievement of environmental outcomes. Apart from the implications, the section offers recommendations for improving the collaborative governance approach to facilitate better achievement of water quality outcomes and, in general, better environmental outcomes. The recommendations can be understood as directions to overcome what could be perceived as governance failure in water quality planning, given the water quality outcomes achieved. The implications and recommendations are framed by the main research question of this study, regarding *how* collaborative governance impacted on environmental outcomes in Australian environmental policy and planning. The section addresses the fourth and final research question: *What are the implications of collaborative governance in Australian natural resource planning and management?*

Through the findings of the research, I infer that: 1) *the governance evaluation implies that collaborative governance is a necessary but insufficient condition to improve water quality outcomes (and environmental outcomes in general);* and 2) *the 'impurity' of collaborative governance calls for a metagovernance role to better manage the tensions between mixed governance approaches.*

The first implication is given by the mixed impact of collaborative governance, which is shown through its strengths and weaknesses as well as its 'impurity'. The important thing to highlight about this first implication is that, overall, collaborative governance seems to have failed as the condition of water quality remained poor after the implementation of the *2009 Reef Plan* (Figure 8.2 provides more detail on water quality outcomes achieved). Before the plan, water quality in the GBR was poor and after the plan, this condition persisted. This indicates a governance failure, exemplified through the limited role of collaboration, its mixed impact and tensions, as well as the varied regional collaborative implementation approaches. However, I argue that failures in collaborative governance offer only a partial explanation as other variables are in place in the water quality issue, such as context and external factors (discussed in the second research question). Thus, I argue that these variables, shown in Figure 8.2 as elements of uncertainty, also account for the overall poor water quality condition achieved.

To use an analogy, focusing on the collaborative governance variable is like focusing on ways that the captain and his crew select the direction of the steering wheel (Figure 4.1, Chapter 4) to reach the mainland. Context and the external factors refer, on the other hand, to the physical conditions of the ship, navigation instruments, abilities of the crew, passenger's responses, weather conditions as well as influence of other ships sailing the same ocean. This implies that improving the direction of the steering wheel (e.g. head northeast or southwest) does not guarantee reaching the destination. In the context of this study, improving collaborative governance does not guarantee achieving the goals of a plan or policy, e.g. targeted environmental outcomes.

In other words, it would be simplistic to state that the policy or plan failed because there were failures in governance. Or, through another perspective, assume that by correcting governance failures, the targets and goals of an environmental plan or policy would be achieved. This links with the uncertainty prevailing in the relationship between collaborative governance and environmental outcomes due to multiple variables involved in environmental issues. This unavoidable uncertainty has been stressed by Emerson and Nabatchi (2015); Newig and Fritsch (2009); Scott (2015); Scott (2016); and Ulibarri (2015). As a consequence, I argue that collaborative governance in water quality planning and management is necessary but insufficient to improve environmental outcomes. This is reinforced by the main finding of Chapter 4, where I reached the same conclusion after reviewing international studies focusing on the impact of collaborative governance on environmental outcomes. This implies that the collaborative path adopted for water quality planning in the GBR has been appropriate. However, it requires modifying the collaborative approach to improve its role as facilitator (or indirect driver) in improving environmental outcomes.

The required modifications to the collaborative approach lead to the second implication of this evaluation. Overcoming the failures of collaborative governance call for a metagovernance role that could facilitate better achievement of environmental outcomes. Metagovernance refers to the "governance of governance" (Jessop, 2011, p. 106). It is designed to deal with the tensions introduced by the interaction of different governance approaches within the 'impure' collaborative governance approach. This means that the 'impurity' of collaborative governance is not a negative condition. In fact, there are no 'pure' governance approaches and, therefore, it would be misleading to recommend attaining a 'pure' collaborative governance model. So far, the only means

available to improve the performance of 'impure' governance is metagovernance, as it involves "rebalancing market, hierarchy and networks" (Meuleman, 2008, p. 68). It is important to remind that collaborative governance is a type of network governance.

As metagovernance is designed to manage governance failure, it becomes a tool outside the collaborative governance 'toolbox' of Scott and Thomas (2017). A tool that would allow a better use of the governance 'umbrella' for either expanding it or reducing it as necessary to cover from the damp areas. An example of this metagovernance 'umbrella' is the Better Regulation Toolbox established in the European Union, which includes a variety of tools from different governance approaches to improve the implementation of sustainable development goals (SDGs) (Meuleman, 2015, p. 12305)

The metagovernance role to improve the collaborative approach in the water quality issue fits with the Network Management metagovernance tool of Sorensen and Torfing (2009). Network management introduces the figure of a network manager or metagovernor that can contribute not only in reducing tensions within the collaborative governance process, but also increase equality of these processes through more inclusion and deliberation. In this way, metagovernance — apart from contributing in achieving better environmental outcomes — could promote the democratisation of the collaborative approach. This links with Ansell's (2012) view of 'ambitious' collaborative governance. Hence, a likely consequence of relying on metagovernance would be to improve the limited impact of collaboration in water quality policies and plans.

Considering the collaborative governance arrangements of the *2009 Reef Plan* (Figure 8.1), the federal and state governments could adopt the role of metagovernors. In this regard, both actors had a decisive coordinating function of regional governance, as the one envisioned by Montin et al. (2014), and illustrated by the federal incentive-based role and the state regulatory-based one. Both levels of government can be seen as metagovernors that failed to conduct metagovernance in the implementation of the *2009 Reef Plan* due to their poor collaboration ties. In this case, the federal level cannot rule out the state when attempting to metagovern as the state government has jurisdiction over natural resources, such as water.

A way to improve the combination of the three governance approaches (hierarchy, market and network) would be through an agreement between the potential metagovernors (state and federal governments) to coordinate the implementation of the

water quality plan. In this way, for example, a better combination of governance approaches would ensure that regulations are effective at changing the behaviour of the reluctant land holders, while the incentives are allocated to the appropriate landholders. Metagovernance would also contribute to improve the coordination weaknesses in the multi-level governance implementation setting, which were discussed in the previous research question as well as in Chapter 7. There was an agreement between both government levels to implement the *2009 Reef Plan*[11]. However, it did not translate into practice, according to how the governance arrangements operated and the tensions they created. The lack of collaboration between both government levels was also highlighted by the stakeholders that participated in this study. In 2015, an updated agreement was established to implement the *Reef 2050 Plan*. The metagovernor role could fit in this current plan.

Returning to the ship analogy of collaborative governance, the metagovernor would be an advisor or group of advisors of the captain with specialised skills and training to oversee the ship's route progress to mainland. The metagovernor is an entity from the government. Meuleman (2008) assigns the metagovernor role to a group of public managers. This group or entity from the government should have the ability to understand the tensions created by the interactions of hierarchy, market and collaboration, and manage them to improve their performance. The paradox behind metagovernance though is that it requires collaboration between the actors that appoint this role. In the case of the GBR, it would require collaboration between the stakeholders shown in the collaborative governance arrangements (Figure 8.1). Hence, the call for metagovernance of collaborative governance suggests the need for stronger collaboration. From the governance evaluation perspective I adopted, metagovernance is a way of improving the limited impact that collaboration had in the achievement of water quality outcomes. In this way, metagovernance contributes to making governance more effective.

However, Sorensen and Torfing (2009) warn about the limits of metagovernance, highlighting its complexity and "inherently imperfect strategic practice" (p. 253). The authors underline two key dilemmas in metagoverning: 1) excessive vs insufficient; and

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[11] The *2009 Great Barrier Reef Intergovernmental Agreement* was established between the Queensland and Australian governments to provide a framework through which both governments would work together for the protection of the GBR (Australian Government, 2017).

2) hands-on vs hands-off. In the first dilemma, the inability to find a balance between excessive and insufficient metagovernance can lead to political conflicts, underperformance of governance and fragmentation. The second dilemma also meets the difficulty of balancing hands-on and hands-off metagovernance, where too much hands-on can create implementation resistance, while too much hands-off can lead to loose collaborative ties between the actors. Jessop (2011) adds that metagovernance can also fail as it might be impossible to find the right 'mix' between the governance approaches within collaboration. He adds, somewhat ironically, that the perception of effective governance[12] (supported by metagovernance) has depended on displacing governance issues elsewhere or postponing them indefinitely.

In other words, metagovernance does not guarantee effective governance performance, such as achieving the expected goals of a plan or policy. It is designed more as an amending tool to manage the complexity of governance. This also leads to issues of state capacity, regarding the ability and willingness of the Australian and Queensland governments to metagovern. Nonetheless, this does not invalidate the use of metagovernance as an alternative to improve the impact of collaborative governance on environmental outcomes. Policymakers and planners should be aware of its limits.

8.3.1 Contribution to knowledge

In this section, I present the main contributions of this research, which are based on the key findings and research gaps. First, the thesis advanced knowledge on the role of collaborative governance by showing how a collaborative approach was implemented within environmental policy and planning. This analysis on the implementation of a collaborative approach addressed the research gap on the low evidence that exists around collaborative governance responses to environmental issues, particularly in Australia. The study highlighted the "impure" nature of collaborative governance which, aside from collaboration, mixes market and hierarchy governance approaches in its implementation. The role of collaborative governance is limited by its interaction with other governance approaches. For instance, the "impurity" of collaborative governance limited the expected benefits of collaborating, such as greater levels of deliberation, inclusion and participation from the actors involved.

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[12] Jessop understands effective metagovernance as the capacity to modify and readjust the mix of governance modes according to changes in the issue at hand, e.g. population growth, climate change or financial resources (Chapter 2, metagovernance sub-section).

Second, the study demonstrated how the collaborative approach had a mixed impact on the achievement of water quality outcomes. This addressed the research gap around the level effectiveness of collaborative governance arrangements in delivering environmental policy and planning efforts. The analysis was done through the application of a governance process-outcomes framework, which has not previously been applied to study collaborative governance. Depending on the collaborative governance process examined, collaboration turned out to be either: positive, neutral or negative in the achievement of water quality outcomes. This categorization of the impact of collaborative governance processes advanced knowledge by identifying the strengths and weaknesses within the collaborative approach examined. The process-outcomes analysis focus on the tensions created between the different nature and instruments used by hierarchy, markets and collaboration (e.g. regulations vs incentives and competition vs collaboration).

Third, the thesis advanced knowledge regarding the relationship between collaborative governance and environmental outcomes. This addressed the research gap around the uncertainty that exists in this relationship, particularly around the contribution of collaborative governance in achieving improved environmental outcomes. By considering different levels of governance involved in environmental policy and planning (federal, state and regional), the study showed that collaborative governance represents an indirect driver of environmental outcomes. As an indirect driver, collaborative governance was necessary but not sufficient for improving the water quality outcomes. Moreover, the analysis found that context as well as external factors were drivers in achieving environmental outcomes. Context represented another indirect driver, providing key elements to understand the condition of the research subject, such as geographic and socio-economic characteristics. External factors, such as funding, staff skills or data standards, represented direct drivers in the achievement of environmental outcomes. Through the use of a proxy variable for collaboration (i.e. number of coordinators) at the regional level of governance, it was surprising that funding for on-ground delivery seemed less decisive than collaborative governance in the achievement of water quality outcomes. Thus, collaboration is one of many variables that help resolve environmental issues. Improving governance is an important but not a sufficient condition in the efforts to enhance environmental conditions, such as the quality of water.

Finally, the thesis found that the use of metagovernance tools could improve the impact of collaborative governance on environmental outcomes. In this regard, metagovernance provided a different perspective through which to address the limited impact of collaborative governance. For instance, rather than promoting the use of more "pure" forms of collaboration, metagovernance provides the framework to improve the integration of different governance approaches under the collaborative governance "umbrella". This information is useful for practitioners (e.g. planners and policymakers) working to improve environmental conditions.

8.3.2 Recommendations

Following the discussion, I present the recommendations in a bullet-point format. I consider that this format allows a prompt understanding for the reader. This is also a straight-forward form of presenting the directions that could be followed by policymakers, planners or other people involved in environmental policy and planning. The recommendations are focused on the case study of the GBR. However, they could be applied to other environmental issues in the Australian context. The details of these recommendations have already been presented in the previous content of this synthesis. Through the analysis and evaluation of the impact of collaborative governance on water quality outcomes, I recommend the following:

- Stronger collaboration promoted by the governance arrangements (Figure 8.1):

  o Improve collaborative ties between state and federal levels, particularly to agree on the tools to change behaviour (e.g. regulations and incentives) as well as funding. In addition, improved collaboration would support better coordination in the implementation of water quality policies and plans.

  o Enhance cross-regional collaboration between the NRM regions to support better coordination in the implementation of water quality policies and plans, as well as improve their reporting and monitoring standards.

  o Allocate more funding to regional collaboration, e.g. through the appointment of coordinators or similar roles that promote engagement of the policies' target groups.

- Expand the limited role of collaboration:

  o Use metagovernance to improve collaborative governance:

  o Create an entity or organisation of metagovernors (e.g. public managers from the state and federal governments) devoted to modifying and readjusting the combined governance approaches (hierarchy, market and collaboration) according to the demands of the water quality issue.

  o Develop an agreement between the potential metagovernors, the state and federal governments, to establish the metagoverning entity. This would represent an institution outside and above the four levels of governance (federal, state, regional and local), devoted to steer governance approaches towards the achievement of environmental outcomes.

8.4 Limits and further research areas

The case study analysis of the GBR (Chapters 6 and 7) centred on a five-year period. In this time period (2008-2013), the *2009 Reef Plan* and *Reef Rescue* program were implemented. The case study represents a snapshot in the governance timeline of the water quality plans, which run from 2003 to 2015 and ongoing. As remarked in Chapter 3, focusing on past events in case study analysis is similar to adopting the role of a detective, who examines past events to understand the crime motives and how it occurred (Yin, 2014). In this case, I examined the impact of collaborative governance on environmental outcomes. Collaboration was a governance approach adopted by the *2009 Reef Plan* to improve the water quality condition of the GBR. Similar to a detective, this analysis allowed developing inferences (based on stakeholders' perceptions, data and documents) about the implications on the impact of collaboration on water quality outcomes. Contrary to what official reports said on the role of collaboration in the *2009 Reef Plan*, this study found that the collaborative governance arrangements had a marginal role in plan implementation. Moreover, they were mixed with other arrangements, such as markets and hierarchy. As a consequence, the recommendations focused mainly on suggesting the adoption of stronger collaborative governance arrangements and expanding the limited role of collaboration. This type of research had not been done previously in the Australian context, and it allowed me to present a novel perspective into environmental governance. Studying past events

offered a detailed glance into affairs that occurred in the real world. It is not, therefore, a study of the dead past (Yin, 2014).

Recent developments have altered the course of events in the GBR's water quality planning and management, such as modifying the water quality targets and prioritising land-uses (Australian and Queensland Governments, 2013; and Australian Government, 2015b). However, the governance challenges found in this study remain relevant as water quality planning still relies on collaborative governance. Despite the limited focus of the five-year period of this study, the governance findings and implications presented are important as, so far, there has not been an evaluation of governance based on water quality outcomes achieved in the GBR (either at the general or at the regional scale of governance). Moreover, the research outputs, such as the process-outcomes governance evaluation can be applied to any policy and planning issue in the environmental realm and others. Also, this type of research can be undertaken in international contexts, not only in Australia.

During the study, the majority of the stakeholders interviewed argued that the collaborative governance arrangements were too complex. Governance improvements, they added, should focus on simplifying these governance arrangements. After this research and based on the evidence, I would state that rather than simplifying, the collaborative governance arrangements require a better combination. As I recommended in the previous section, this could be achieved through metagovernance, which focuses on improving the combination of the governance approaches that coexist within collaborative governance. As water quality is a complex issue, it requires also complex solutions. Therefore, instead of achieving governance simplification, it would be more appropriate to achieve governance coordination.

It is important to note that the case study analysis is based largely on stakeholders' perceptions. In other words, on what the stakeholders think occurred with governance of in the *2009 Reef Plan* and *Reef Rescue*. As Peters (2016) argues, governance is mainly determined by the decisions of the actors (individuals and organisations) that participate in policymaking or plan making. However, the limit that perceptions might pose on the study was balanced with data on water quality outcomes achieved, the development of a proxy variable to assess collaboration as well as document analysis. This provided a contrast between what was perceived and what actually occurred. Moreover, this study combined two main evaluation methods used to examine

collaborative approaches stated by Conley and Moote (2003): measure tangible outcomes (e.g. comparing achieved water quality outcomes with targeted ones, and designing proxy variables to link collaboration to outcomes), and measure participant's perceptions (e.g. short survey and semi-structured interviews with key stakeholders). In addition, Rauschmayer et al. (2009) argue that perceptions constitute one of the main sources in evaluating collaborative approaches.

Finally, focusing on governance as the main explanatory variable offers a partial picture on environmental policy and planning. One mainly concerned with governance roles and impacts, and the relevance of governance in environmental policy and planning. This study, hence, did not represent a multiple variable investigation. However, the focus on governance in its collaborative approach allowed me to offer details on how this variable represents an indirect driver of environmental outcomes. More important, it allowed me to show how this indirect driver can be improved to achieve better environmental outcomes.

Due to the nature of this study, new findings lead to new questions, and limited time does not allow covering all issues that arise during the research. Along Chapters 6 and 7, I identified further research areas, which I summarise below:

- Examine informal collaboration processes between the stakeholders at the regional level of governance. This would require a more in-depth case analysis, such as comparing two NRM regions in the GBR as well as other Australian or international NRM and planning contexts.

- Apply the proxy variable to other collaborative governance contexts, identifying ways to include within it levels of staff skills.

- Analyse the role of public participation within collaborative environmental policy and planning.

- Measure the impact of external factors (outside the governance arrangements) on environmental outcomes, such as market shifts, weather events, and monitoring and reporting methods.

- Examine the impact of collaborative governance on other type of outcomes, such as social (e.g. trust, capacity building or democratic reconstruction) or economic

(e.g. job creation, sources of revenue or innovation) to offer evidence on the benefits of collaborating, apart from the improvement on environmental outcomes.

- Analyse the impact of power and politics in the relationship between collaborative governance and environmental outcomes.

- Compare collaborative approaches that use competition with those that do not rely on this tool to find out its contribution on the achievement of improved environmental outcomes.

8.5 Conclusions

In the quest to improve planning and management of natural resources, such as water, governance is recognised amongst the most significant but vague challenges. As stated by Peters (2016), governance is important as it represents the process through which societies attempt to control their economies and societies. Improving the conditions of natural resources stands within this governing attempts. Similar to most developed countries, Australia adopted collaborative governance approaches to improve environmental conditions. In theory, collaboration seemed to represent a more appropriate approach to manage and plan natural resources. In practice, however, the appropriateness and adequacy of collaboration in environmental governance is disputable. This study is positioned amongst those evaluating the benefits of collaborating based on the results it achieved. For this purpose, I focused on the impact of collaborative governance on environmental outcomes. This is the first study in Australia to adopt this focus.

By focusing on water quality outcomes in the GBR case study, this study determined that collaborative governance was limited but, nonetheless beneficial. Hence, rather than adopting another governance approach, collaborative governance requires modifications to improve its contribution towards the achievement of better water quality outcomes. In other words, collaboration is appropriate to manage and plan natural resources. However, it requires adjustments to improve environmental outcomes. Within this task of improving collaboration, the study highlighted how collaborative governance in practice includes other governance approaches, representing a 'hybrid' or 'impure' approach to governance. This involves the creation of tensions between apparent contradictory elements in collaboration, such as market and hierarchy

governance instruments. Contrary to what could be expected, these tensions would not be improved by attaining more 'purity' in the collaborative approach. Instead, I argued that the 'impurity' could be managed through metagovernance. As a consequence, I developed a set of recommendations that, at its core, require stronger collaboration and commitment between the federal and state governments in Australia.

As governance is concerned with the quality of life, understanding governance contributes in understanding its contribution to life quality of human and other beings (as stated in the Introduction of this chapter). By evaluating governance, I was able to provide an explanation of not only how collaborative governance impacted on water quality but, more importantly, I stressed the potentialities that lie in the collaborative approach to improve water quality outcomes and, by extension, other environmental outcomes. This effort to understand governance and its impacts on outcomes can and should be undertaken in environmental or other policy issues, either in Australian or international contexts. The main benefit, apart from reducing the vague nature of governance practice, is to find ways of improving quality of life, in which a healthy environment is included.

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APPENDICES

Appendix A. Chart of objectives

	Objectives	Tasks	Data Collection	Data analysis	Expected Outcomes
1	**Identify frameworks and criteria that underpin evaluation of collaborative governance approaches on environmental outcomes** **Question:** 1) Based on the environmental outcomes achieved, have collaborative forms of governance improved the condition of natural resources?	1. Develop an evaluation framework by reviewing the literature about governance in environmental planning and its impact upon outcomes Disciplines involved in the review: Planning, Policy, Political Science and Environmental Management 2. Select those papers that specifically relate with the topic "Governance and Outcomes (environmental)" from policy and planning perspectives 3. Identify and select an evaluation criteria based on collaborative governance processes examined	1.Search for the Literature in Google Scholar,ScienceDirect and other databases available (based on journal articles, books, book chapters and grey literature 2. Read peer-reviewed articles and grey literature about collab governance-plan&policy evaluations of implementation 3. Narrow the search and selection to the main topic by using key words in search engines such as "environmental governance and implementation"; "evaluation of collaborative governance"; "environmental governance and outcomes"; "environmental planning and outcomes"; "environmental outcomes"; environmental planning implementation"; "collaborative governance and outcomes"; "results of natural resource management" 4. Obtain elements of governance and implementation from the review (factors or variables) used to assess policy&planning initiatives related with environmental matters	1. Categorize topics; identify definitions, research approaches and main trends within the field of research 2. Organize papers and categorize the main results by topic (e.g. governance and outcomes; planning and outcomes; or implementation and outcomes) 3. Identify and select the governance and implementation variables with the strongest impact in terms of benefits to the environmental planning process	1. Classification of the different impacts of collaborative governance on natural resource conditions, e.g. environmental outcomes 2. Obtain a general picture of evaluations on the impact of collaborative governance on environmental outcomes 3. Develop an evaluation framework with a list of criteria (governance and implementation aspects). The criteria serve as a benchmark for governance evaluation 4. Write a literature review paper for a Journal about the literature on governance and outcomes/results from a planning perspective
2	**Apply a case study analysis to evaluate the impact of collaborative governance on environmental outcomes within Australia.** **Questions:** 1) What was the role of collaboration in the	1. Justify the case study. The GBR represents a key Australian ecosystem and involves 6 NMR regions: Burnett-Mary; Cape York; Burdekin; Fitzroy Basin; Mackay Whitsundays; and Wet Tropics	1.Search for information about the case-study region (the GBR) and the sub-regions within it in official websites as well as in research papers 2. Review a specific water quality plan (the 2009 Reef Plan) within the GBR to find out about the water quality outcomes, and how the	1. Obtain a general picture of the GBR, in terms of area; population; history of water quality planning; socio-economic contribution and environmental significance. 2. Analyse the Reef Plan progress reports to identify the water quality outcomes	1. Develop an overall picture of the impact of collaboration/collaborative governance arrangements on water quality impacts achieved by the Reef Plan. 3. Develop a regional picture of the impact of collaborative governance on the water quality outcomes achieved by the NRM regions. 3. Write a journal

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	implementation of the 2009 Reef plan? 2) How regional collaborative governance approaches impacted on environmental outcomes achieved by the NRM regions of the GBR? 3) What are the strengths and weaknesses of the collaborative governance approach?	2. Evaluate the impact of governance through the use of the governance evaluation framework	contributed to the general objectives of the plan. Perform a series of semi-structured interviews (from 20 to 25) with the key stakeholders in order to evaluate and discuss the results obtained from the Reef Plan. The key stakeholders include people from the NRM groups (CEOs and managers); state and federal levels; industry (farming and agriculture); conservation (NGOs); and scientific community (academics)	achieved by each sub-region, highlighting their different contributions and contexts (including their degree of alignment with the regional NRM Plans). Complement this information with external reviews to include different perspectives, 4. Develop a proxy variable for collaboration at the regional level to distinguish impacts of regional collaboration on water quality outcomes. 3. Coding of the interviews using Nvivo software. The purpose is to organize the topics covered in the examination. This would allow identifying the strengths and weaknesses of the collaborative approach as well as the different approaches to collaboration in each NRM region of the GBR. 4. Analyse the information obtained from document reviews, and interviews using the evaluation framework as an instrument for supporting the interpretation of results	article/conference paper of the governance evaluation of water quality in the GBR based on the collaborative governance processes criteria obtained in the first objective. 4. Develop the story of the impact of collaborative governance on the Reef Plan results based on the experience and perceptions of stakeholders
3	**Develop a series of recommendations from the case study analysis.** **Questions:** 1) What are the implications of collaborative governance in Queensland's natural resource planning and management?	1. Highlights main findings obtained from objective 2 research questions and compare them with other similar studies. 2. Identify the implications of the findings by extracting the main themes that emerged from the case study analysis	1. Organize and review the findings, linking them to previous studies and to the general themes emerging from the case study analysis	1. Identify the challenges and opportunities of collaborative governance in water quality planning within the Reef context. 2. Deduce the implications of the findings from the case study analysis (following the deductive method of inferring information from the evidence and reasoning). In the deductive analysis, the detective/researcher extracts the conclusion of the investigation through the evidence of the case and 'common' sense' to offer an account of what	1. Journal paper about collaborative governance focused on the challenges/recommendations of this approach when used in environmental policy and planning. What and what cannot be expected from collaboration.

				occurred and what/how it can be improved.	

Appendix B. Governance frameworks reviewed

	Title	Theory	Purpose	Methods	Findings	Research gap	Scope	Locality/ Case study
1	Governance for sustainability: evaluating environmental decisions (Adger et al, 2003)	Interdisciplinary approach, 'thick description'	Understand environmental decision-making and its outcomes	Desktop analysis Case study	Able to take into account different variables by examining a decision through a four-criteria.	Institutional framing and outcomes	Local	UK
2	Framework for monitoring social process and outcomes (Chapman, 2014)	Ecosystem services theory Adaptive management Transformative learning	Evaluate the social outcomes of collaborative environmental programs	Case study	Social outcomes can be identified by using a Monitoring and Evaluating approach	Feedback and refinements to the evaluation model	Regional	Kenya
3	A goal specificity framework (Biddle and Koontz, 2014)	Not clear	Measure improvements in envin outcomes in collaborative governance	Multiple case studies Surveys Water quality data	Collaboration improves environmental outcomes when specific goals are set	Outputs that might be appropriate indicators for other collaborative efforts, e.g. climate change	National	US
4	Governance systems analysis (Dale et al, 2013)	Structuralist-Functionalism	Analyse multi-thematic, complex and poly-centric governance systems	Desktop analysis Case studies	Governance systems are comprised by structures and functions and their analysis informs transformational change or improvements	Test the framework in a range of multiple topics and domains	Regional	Australia
5	Integrative framework for collaborative governance (Emerson et al, 2012)	General Systems theory	Analyse the dynamics and actions produced by collaborative governance regimes	Case study analysis	Divides collaborative process by its dynamics (principled engagement, shared motivation, and capacity for joint action) and actions within an adaptive cycle	Test the framework in a range of multiple topics and domains	International	US
6	Evaluate and design collaborative planning (Faehnle and Tyrvainen, 2013)	Not clear	Develop a success criteria to evaluate collaborative planning processes and outcomes	Desktop analysis Case studies Public meetings	Offers a view of what a successful collaborative approach should accomplish	Test the success criteria in other cases	State	Finland

7	Investigating Policy Processes: The Governance Analytical Framework (GAF) (Hufty, 2011)	Not clear	Analyse how the governance process influences upon a dependent variable such as a problem (e.g. inequity or biodiversity)	Case studies	Based upon a clear governance definition, the GAF allows to analyse variations between policy and reality	Test the GAF in other cases to better understand its limits and possibilities	National	Argentina
8	Identify governance strategies that support sustainability (Kenward R. E. et al 2011)	Not clear	Link governance strategies with outcomes related with increased sustainability and biodiversity	Multiple case studies Information theoretic modelling	Strategies with adaptive management and leadership contribute strongly to achieve positive outcomes	Test the predictions in other areas	International	EU, US and different developing countries
9	Good governance framework for protected terrestrial areas (Lockwood, 2010)	Rational choice adaptive management	Link governance effectiveness with governance quality	Multiple case studies Delphi method	Develops a criteria to evaluate governance outcomes	Test the framework in other protected areas and governance modes	International	France, India, Scotland and Spain
10	Transition management framework (Loorbach, 2010)	Transition management Systems theory	Assess how societal actors deal with complex issues and understand the resulting transitions	Desktop analysis Case studies	Analyse and structure ongoing governance processes in society	Translate the framework to other sociopolitical contexts and cultures	National	Netherlands
11	IAD (Ostrom, 1999; 2005)	Rational choice	Identify the institutional elements of a governance system and their relationships to provide diagnosis	Desktop analysis Case studies	Understand and explain how common-pool resources are governed	Test the framework in other areas and settings	National	US
	IAD applied as main framework							
	11a	IAD applied to water management and planning (Ananda and Proctor, 2013)	Use of IAD to evaluate a collaborative approach in a watershed	Desktop analysis Case studies Workshops	Current top-down arrangements limit the scope of collaboration	Collaborative approaches in improving water management	Sub catchment	Australia
	11b	IAD and ecosystem-based management (Imperial, 1999)	IAD seen from the perspective of ecosystem-based management	Desktop analysis	IAD is designed to evaluate the implementation of a program, but does not provide clear solutions about how to achieve better outcomes	Institutional design and its impact on effective management	N/A	US

	11c	Analyzing complex water governance regimes (Pahl Wostl, 2010)	IAD adapted and extended to analyze water management regimes and find out how change occurs	Desktop analysis Case studies	Useful for other contexts as it is designed for complex multi-governance regimes	Test the framework in other water case studies	Regional	EU
12	Analyze sustainability of social-ecological systems (Ostrom, 2009)	Rational choice	General framework that allows identifying the factors that enhance sustainability	Case studies	Predicts when the users of a resource system will engage in self-organization	Test the framework in multiple resource systems	National	US
13	Framework for analysing adaptive capacity and multi-level learning (Pahl Wostl, 2009)	Adaptive management Social learning	Designed to explain changes in governance using a triple-loop of social learning	Desktop analysis Case study	Governance structures that combine bottom-up with top-down approaches lead to higher adaptive capacity	Develop shared conceptual frameworks that take into account the complexity of governance regimes	Regional	EU
14	Fit-for-purpose governance framework (Rijke et al, 2012)	Adaptive governance	Evaluate if governance systems are fit for their purpose	Critical literature review	Governance is divided between structures and processes and each framework should be fit to a context and purpose	A diagnostic approach that requires empirical evidence	International	Australia & Netherlands
15	Process-Outcomes governance framework (Rauschmayer et al, 2009)	Not clear	Evaluate governance processes and outcomes within a single framework	Desktop analysis	Governance processes and outcomes can be evaluated simultaneously, where good processes reduce uncertainty	Proposed framework to synthesize governance processes and outcomes	International	European Union
16	The Advocacy Coalition Framework (ACF) (Sabatier and Jenkins-Smith, 1999; and Weible et al 2011)	Adaptive governance Social constructivism	Examine policy change by looking at policy advocating by coalitions within a policy subsystem	Desktop analysis Case studies	Policy change is explained by the adoption of the beliefs of a coalition around a given issue within the policy subsystem	Test the ACF in other areas/subsystems, e.g. role of coalitions in diffusing policy innovations	International	US
	ACF applied as main framework							
	16a	ACF applied to drug policy (Kubler, 2001)	Use of ACF to understand change in Swiss drug policy, complementing the analysis with social movement theory	Case study	Successful change is explained through a shift in beliefs of key actors within a coalition; however, the ACF fails to explain persistence of coalitions	Analyse the role of 'policy brokers' in mediating interactions between coalitions	National	Switzerland

Appendix C. Indicative questions for the semi-structured interviews

Section 1: Background information – Role and interests

1. Name
2. Organisation
3. Title/role:
4. What was your involvement in the implementation of the 2009 Reef Plan program?
5. Over what period were you involved? From …………… to ………………..
6. In general, what is your interest in NRM planning and what do you value most of it?
7. What was your organisation's main interest in relation to Reef Plan and Reef Rescue (& water quality issues)?
8. Why was it important to be involved in Reef Plan and Reef Rescue?

Section 2: Collaboration in the implementation of *Reef Rescue*

9. According to the 2014 Reef Rescue Achievements report, collaboration between the main stakeholders such as the regional NRM bodies, the agricultural sector and the state and federal governments was key for the successful delivery of the program. In your view, what role did collaboration between these stakeholders played in the implementation of *2009 Reef Plan*?

The evaluation instrument for collaborative governance processes (Appendix E) was inserted in this Section.

Section 3: Effectiveness at implementing *Reef Rescue*

The next questions discuss the effectiveness at implementing *2009 Reef Plan*, based on the water quality outcomes achieved and the strategies followed to reduce the impacts on water quality. Please read the information provided in Tables 1 and 2 as this provides the starting point for the questions that follow.

Table 1: Water quality outcomes achieved by NRM regions
(Australian and Queensland Governments 2014)

NRM bodies	Reduce nitrogen by 50% (by 2013)	Reduce sediment by 20% (by 2020)	Reduce pesticides by 50% (by 2013)
Burnett-Mary	15%	3%	28%
Cape York	6%	8%	0
FBA	3%	4%	5%
NQ Dry Tropics	10%	16%	13%

	17%	9%	42%
Reef Catchments			
Terrain NRM	8%	13%	26%
GBR catchment	**10%**	**11%**	**28%**

Table 2: Achievements in land management practices for each region and overall water quality condition after implementation (Australian and Queensland Governments 2014)

NRM bodies	50% improved grazing practices	80% improved sugarcane practices	80% improved horticulture practices	Overall water quality condition 2013
Burnett-Mary	19%	55%	50%	Poor
Cape York	48%	0	0	Moderate
FBA	28%	39%	42%	Poor
NQ Dry Tropics	54%	55%	63%	Moderate
Reef Catchments	69%	49%	66%	Moderate
Terrain NRM	23%	45%	50%	Poor
GBR catchment	**30%**	**49%**	**59%**	**Poor**

10. Please explain how *Reef Rescue* funds were allocated in relation to the implementation projects in each region. How did this affect the outcomes for water quality?

11. To what extent do you consider that the intended water quality outcomes of *2009 Reef Plan* have been achieved?

12. To what extent were the water quality outcomes attributable to the plan, or did other factors influence the outcomes?

13. Which of the three water quality outcomes reported were easier to achieve and why?

14. Which of the three water quality outcomes were more difficult to achieve and why?

15. Which aspects of the plan were best put into practice?

16. Which aspects were least put into practice?

17. Did collaboration between stakeholders make it easier to put the plan into practice? If "yes", which partnerships do you think were most important for putting the plan into action?

18. Did the differences in funding of *Reef Rescue* led to less collaboration (compared with previous efforts) in the implementation of *2009 Reef Plan*?

19. How would you describe the plan achievements?

20. To what extent the mechanisms in place to monitor and evaluate progress of the plan were appropriate?

21. To what extent the water quality outcomes obtained were positive for the region?

22. Would these achievements have occurred without the collaborative arrangements in place? Why?

23. Following the experience with *2009 Reef Plan*, what are the key challenges for the regional model of collaboration?

24. What are the opportunities that this collaborative approach offers in practice?

Section 4: Context

25. Thinking about significant events within the regional planning context, such as the change of government programs (from Natural Heritage Trust to Caring for Our Country), how do you think they affected the way planning was put into practice with *2009 Reef Plan*?

26. Reflecting on your experience with *2009 Reef Pan* and *Reef Rescue*, what do you think could be improved in planning for water quality?

27. Following the experience with *2009 Reef Plan*, what do you think is the future of planning for natural resource management within the Reef region? How does this make you feel?

Section 5: Feedback

28. Do you have any other comments, issues or questions that you would like to raise?

Appendix D. Participant information sheet

You are invited to take part in a research project undertaken by the University of Queensland (UQ). Information is provided about the project so that you can make an informed decision on whether or not to participate.

My name is Jaime Olvera-Garcia and I am a PhD candidate at the School of Earth and Environmental Sciences (SEES) of UQ. My research is evaluating the impact that collaborative governance has had on the environmental outcomes produced by natural resource planning in Queensland, Australia.

The main objective of my study is to find out if collaborative governance arrangements have effectively led to improved environmental outcomes, such as better water quality, and to identify the main strengths and weaknesses of collaboration. I selected the 2009 Reef Plan, along with its *Reef Rescue* programme as my case study. *Reef Rescue* was the implementation strategy of the *2009 Reef Plan,* which aimed to improve water quality in the Great Barrier Reef. The time-frame included five years, from 2008 to 2013 in the six regions that comprise the Reef catchment: Burdekin, Burnett-Mary, Cape York, Fitzroy Basin, Mackay Whitsundays, and the Wet Tropics. My research explores the different experiences that each region had in implementing this programme, in terms of the role of collaboration in achieving water quality outcomes.

Reef Rescue was created by the Australian Government in 2008 as part of the Caring for Our Country program. It was also a part of the *2009 Reef Plan,* which provided the collaborative framework through which *Reef Rescue* was implemented. The plan was developed and implemented through collaboration among stakeholders from the federal and state government as well as from the regional Natural Resource Management (NRM) bodies, the agricultural sector and local environmental groups. The main goal of Reef Rescue was to halt and reverse the decline in the quality of water entering the Great Barrier Reef lagoon by 2013.

To achieve this goal, a set of clear and measurable water quality targets were defined, which focused on reducing three main pollutants from intensive agricultural industries: nitrogen, sediments and pesticides. The main strategy for achieving the water quality targets was to promote, through collaboration, a change in land management practices. For the purposes of this research, collaboration is defined as a governing arrangement where one or more public agencies directly engage non-state stakeholders to collectively make and implement plans and policies. Collaboration aims to improve the implementation and results of a plan through a series of practices and processes.

The interview seeks to find out your perceptions about the role that collaboration had in the implementation of *2009 Reef Plan*, as well as your views on the challenges and opportunities of collaborating in planning for natural resources. The interview is anticipated to take approximately one hour. Your responses will be anonymous. It is important to mention that your participation is voluntary, so you may withdraw at any time without penalty

This study adheres to the Guidelines of the ethical review process of the University of Queensland and the *National Statement on Ethical Conduct in Human Research*. You are free to discuss your participation in this study with any of my advisory team or with myself and all contact details are provided below. If you would like to speak to an officer of the University not involved in the study, you may contact Dr Paul Dargusch, the Ethics Officer on (07) 3365 1594 or email p.dargusch@uq.edu.au.

Thank you for your time and responses.

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Dr Paul Schmidt│P (07) 334-67845│E: paul.schmidt@uq.edu.au

Appendix E. Evaluation instrument for collaborative governance processes

I am going to make a number of statements about the implementation of *2009 Reef Plan* and I would like you to indicate the extent to which you agree with each statement. Please rate your agreement as Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D) or Strongly Disagree (SD). Please explain your responses.

Statements	SA	A	N	D	SD
Stakeholder engagement: 1. Including the stakeholders –such as the agricultural industry, state and federal governments, NRM bodies and World Wildlife Fund– in the implementation of *2009 Reef Plan* led to better achievements of water quality outcomes. 2. Stakeholders were informed regularly about the progress of implementation through engagement processes such as meetings or workshops. 3. Differences in power and access to resources among stakeholders did not affect the achievement of water quality outcomes.					
Coordination: 1. The responsibilities of each stakeholder group (e.g. regional NRM bodies, agricultural industry and state and federal government) were clearly identified during the implementation of *2009 Reef Plan.* 2. During implementation, the federal government cooperated effectively with the regions and agriculture industry in the effort to change land management practices (e.g. grazing, sugarcane and horticulture). 3. During implementation, the state government effectively cooperated with the regions and agriculture industry in the effort to change land management practices. 4. During implementation, the regional NRM bodies effectively cooperated with the agricultural industry in the effort to change land management practices 5. In general, cooperation between the stakeholders involved in *2009 Reef Plan* led to an improvement in land management practices					
Incentives: 1. Relying on voluntary compliance led to better water quality outcomes. 2. Availability of incentive resources (e.g. funds) drove practice change					
Regulations: 1. Statutory tools and guidelines in place effectively promoted compliance with the *2009 Reef Plan.* 2. Regulatory tools increased stakeholders' understanding of practice change 3. Increased formalisation of the NRM group (e.g. shift from non-statutory to statutory body) would lead to better achievements of water quality outcomes?					

Public participation:
   1. The views of the citizens within the regions were incorporated in the implementation of *2009 Reef Plan* (e.g. through forums or meetings).
   2. Informing the citizens about the objectives and progress of *2009 Reef Plan* was beneficial for the results accomplished by the programme.					

Learning:
   1. The knowledge and experience that the stakeholders (e.g. regional NRM bodies, agricultural industry and state and federal governments) acquired from the implementation of the previous 2003 Reef Plan contributed positively in achieving the water quality targets.
   2. Knowledge about the regional conditions was shared between the stakeholders involved in the implementation of *2009 Reef Plan.*
   3. The implementation of *2009 Reef Plan* provided better ways of managing water quality issues that could be used in future land planning policies.					

Decentralization:
   1. The resources of the NRM regions (e.g. financial or human resources) contributed to achieve better water quality outcomes.
   2. The increase of autonomy allocated to the NRM bodies led to better water quality outcomes.
   3. Devolving the implementation of *2009 Reef Plan* to the regions was beneficial for the goals of the program.					

Competition:
   1. Competing for grants between the stakeholders led to better water quality outcomes.
   2. The competition for funds complemented the collaborative nature of *2009 Reef Plan*.
   3. Competing for water quality grants was in the best interest of the stakeholders.					

Appendix F. Ethics Approval Letter

27 October 2016

TO: Jaime Olvera Garcia
FROM: Iderlina Mateo-Babiano GPEM Ethics Officer
CC: Prof Neil Sipe, Prof Marc Hockings

RE: Application for Ethics Approval

PROPOSAL TITLE: *The impact of governance on regional natural resource planning in Queensland, Australia* [GPEM number 20161003]

In my capacity as the School of GPEM Ethics Officer, I have reviewed the above research proposal for compliance with University and School regulations governing human subjects research.

The proposed research is not subject to higher level review by the University Behavioural and Social Sciences Ethical Review Committee (BSSERC) for the following reasons: 1) the research does not directly involve human subjects from vulnerable or special populations, 2) the research does not involve any risk above "everyday living", 3) the research is not intrusive, and 4) informed consent will be obtained before data collection, participation is voluntary, and participants may withdraw at any time. The research is thus classified as low risk and School level ethics approval is appropriate.

The research proposal, as presented, complies with the National Statement on Ethical Conduct in Human Research and the associated university regulations. You may conduct the research subject to the following conditions. 1) the sruveys/interviews should be conducted as described in the research protocol, 2) participants should not be personally identifiable in the results without explicit permission of the participant, 3) the data collected is to be kept in a secure location. Should any of the above conditions change, you must refer the amended research protocol back to the GPEM Ethics officer.

If you have questions about the ethics review process, please contact me.

Dr Iderlina Mateo-Babiano (i.mateobabiano@uq.edu.au)
Ethics Officer
School of Geography, Planning, and Environmental Management