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New pathways within developing city-scale contexts, Cape Town, South Africa

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Governing Coastal Risk and Vulnerability

*New pathways within developing city-scale contexts,
Cape Town, South Africa*

Darryl Colenbrander

A coastal landscape in Cape Town, South Africa. In the foreground, a sandy beach is partially enclosed by a chain-link fence supported by wooden posts. Two people are walking on the beach to the right. In the background, a large, flat-topped mountain (Table Mountain) dominates the horizon under a clear blue sky with some light clouds. The ocean is visible between the beach and the mountains.

Governing coastal risk and vulnerability: new pathways within developing city-scale contexts, Cape Town, South Africa.

Darryl Colenbrander

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Governing Coastal Risk and Vulnerability

New pathways within developing city-scale contexts, Cape
Town, South Africa

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aan de Universiteit van Amsterdam
op gezag van de Rector Magnificus

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Faculteit: Faculteit der Maatschappij- en Gedragwetenschappen

*I dedicate this dissertation to those that have
dedicated themselves to safeguarding beaches as
democratic, public spaces.*

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Abbreviations and acronyms

ACC	African Centre for Cities	IG	Interactive Governance
ADA	Argumentative Discourse Analysis	IMO	International Maritime Organization
AISSR	Amsterdam Institute for Social Science Research	IOC	International Oceanographic Commission
CAPA	Cape Town Adaption Plan of Action	IPCC	International Panel on Climate Change
CCT	The City of Cape Town Local Government Municipality	KTP	Knowledge Transfer Programme
CMB	Coastal Management Branch	MCC	Municipal Coastal Committee
CSAG	Climate Systems Analysis Group	MPA	Marine Protected Area
CSIR	Council for Scientific and Industrial Research	NCC	National Coastal Committee
DEA&DP	Western Cape Province of the Department of Environmental Affairs and Development Planning	MSL	Mean Sea Level
EFF	Economic Freedom Fighters	ODTP	Organizational Development and Transformation Plan
ERMD	Environmental Resource Management Department	ORI	Oceanographic Research Institute
EU	European Union	PCC	Provincial Coastal Committee
FAO	Food and Agricultural Organization of the United Nations	PEPCO	Planning and Environment Portfolio Committee
GDP	Gross Domestic Product	SAIIA	South African Institute for International Relations
GESAMP	Group of Experts on the Scientific Aspects of Marine Environmental Protection	SG	System to be Governed
GCM	Global Climate Model	SSI	Stewart Scott International
GI	Governance Interactions	UCT	University of Cape Town
GID	Governance and Inclusive Development	UN	United Nations
GS	Governing System	UNDP	United Nations Development Programme
IAEA	International Atomic Energy Agency	UNEP	United Nations Environment Programme
I&APs	Interested and Affected Parties	UNESCO	United Nations Educational Scientific and Cultural Organization
ICLEI	International Council for Local Environment Initiatives	UNISDR	United Nations Office for Disaster Risk Reduction
ICM	Integrated Coastal Management	UKZN	University of KwaZulu-Natal
IDGEC	Institutional Dimensions of Global Environmental Change	URP	Urban Renewal Programme
IDP	Integrated Development Plan	WCED	World Commission on Environment and Development
		WHO	World Health Organization
		WWF-SA	World Wide Fund for Nature South Africa

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Note on co-authorship

Chapters Three, Four, Five and Six are written on the basis of four published peer reviewed articles. Articles associated with chapters Three, Four and Five of this thesis were co-authored, all other chapters (One, Two, Six and Seven) were produced as single author.

Chapter Three

Colenbrander, D.R., & Bavinck, M. (2016). Exploring the role of bureaucracy in the production of coastal risks, City of Cape Town, South Africa. *Ocean & Coastal Management*, 150, 35-50.

Chapter Four

Colenbrander, D.R., Cartwright, A., & Taylor, A. (2015). Drawing a line in the sand: managing coastal risks in the City of Cape Town. *South African Geographical Journal*, 97(1), 1-17.

Chapter Five

Colenbrander, D.R., & Sowman, M. R. (2015). Merging Socioeconomic Imperatives with Geospatial Data: A Non-Negotiable for Coastal Risk Management in South Africa. *Coastal Management*, 43(3), 270-300.

Chapter Six

Colenbrander, D.R. (in press). Dissonant discourses: revealing South Africa's policy-to-praxis challenges in the governance of coastal risk and vulnerability. *Journal of Environmental Planning and Management*.

The arrangements of co-authorship have been as follows: Chapter Three is co-authored with Professor Maarten Bavinck. Professor Bavinck made contributions to the theory section and minor contributions to the overall flow of the argument. Chapter Four is co-authored with Anton Cartwright and Dr Anna Taylor. Both Mr Cartwright and Dr Taylor made contributions to the theory and flow of the argument. Chapter Five is co-authored with Professor Merle Sowman who fulfilled the role of local supervisor in terms of the Mistra *Urban Futures Knowledge Transfer Programme*. Complimentary publications and outreach material are listed in Annexure A.

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Prologue

This dissertation is about the governance of coastal risk in developing city-scale contexts, South Africa. While this research focuses on the geographic area constituting Cape Town, one of Africa's most important coastal economic hubs, the ambit of this research does also extend to a broader analysis of the coastal governance landscape at both provincial and national levels and scales. This landscape constitutes a wide range of governance actors from civil society, national, provincial and other local spheres of government, non-government organizations, parastatals and research institutes. The configuration of this governance landscape and the dynamic interplay between organizational form, prevalent discourses, knowledge orientations, policy and legislative frameworks, networks and power differentials both within institutions and between institutions and other actor coalitions all play a role in shaping the nature and trajectory of coastal governance in South Africa.

Of particular relevance and influence to coastal governance in South Africa is its history. The transition from apartheid and an authoritarian rule to a democracy in the early 1990's, has, and still is, playing a key role in this regard. This influence primarily relates to restoring, and further developing, principles of inclusivity, equity, transparency, engagement, and ultimately the development of governance modes that promote both procedural and distributive justice. The coalescence of the transition to democracy and an appreciation of the need to better manage South Africa's rich coastal resources was epitomized in the following statement given by former president of South Africa, Nelson Mandela:

Africa's long and beautiful coasts and the abundance of marine resources can contribute to providing economic, food and environmental security for the continent. These coastal and marine resources, like the rest of Africa's environmental resources, cannot continue to be exploited in a manner that does not benefit Africa and her people. This is a paradox of a people dying from hunger, starvation and poverty when they are potentially so rich and well endowed.¹

1 Excerpt from a message to an international audience on "Co-operation for the development and protection of the coastal and marine environment in Sub-Saharan Africa", Cape Town, December 1998 (DEAT, 2001, p.18).

The potential of South Africa's abundant coastal resources towards promoting socio-economic upliftment has resulted in a number of developmental initiatives designed to capitalize on the value that such resources provide. One such initiative is that of Operation Phakisa. Launched in 2014, 'Phakisa' means 'hurry up' in Sesotho. Operation Phakisa is intended to address constraints in delivery through expediting development priorities identified in South Africa's National Development Plan. This project provides a framework from which 'Government, organized business, labour and citizens can work together to accelerate economic growth and resolve the triple challenge of unemployment, poverty and inequality' (National Department of Planning, Monitoring and Evaluation, 2017). The Oceans Economy, one of three focal points within Operation Phakisa, identifies four critical areas from which to unlock the economic and development potential of South Africa's marine and coastal environment. These include Aquaculture, Offshore Oil and Gas, Marine Protection and Governance as well as Marine Transport and Manufacturing.

While Operation Phakisa is being spearheaded by national government targeting specific industry and sectors, the political drive to harness the socio-economic potential of coastal resources is equally evident at the local level. Excerpts from the following correspondence (dated 6th December 2010) between a City of Cape Town Councilor² named Danny Christians and a municipal planning official highlights both the 'coastal development' and 'restorative justice' imperative within local government:

'Dear Mr Penxa,

With the construction of Mitchell's Plain³ in 1975 and Khayalitsha in 1985 very little was done to address our ghost coastline.

Since 1985 I have been fighting with the City [City of Cape Town Municipality] to give meaning to our lives in addressing the skew coastal developments that occurred during the apartheid years. These skewed developments where one race has had the superiority over another race of inferiority, has led to economic confusion where the

2 A councilor is a political representative for communities within a particular district, their responsibility of which is to ensure the interests of the community are met.

3 Both Mitchell's Plain and Khayalitsha were towns established in terms of the Group Areas Act (Act No. 41 of 1950) under the apartheid regime and which were designated for the settlement of non-whites within the Cape Flats area of the False Bay. Under apartheid policies and laws, "non-whites" denoted Black, Indian and Coloured South Africans.

coastal towns such as Mitchells Plain and Khayalitsha are labour pools for the affluent areas elsewhere. Then already I professed that our coastline needs to be tapped in for the following reasons:

- *Stimulate Employment opportunities on the coast*
- *Alleviate Poverty*
- *Grow the Economy of South Africa*
- *Introduce new Educational and Cultural projects*
- *Social Upliftment*
- *Environmental Management, Education and Training*
- *Coastal Zone Management*
- *Tourism*
- *Increase the City's tax base.*

*In short we need **Equitable Development, Sustainable development and Optimal Development** on our coast to address all of the above.'*

On the 1st of June 2010 I won the biggest single battle of my life at the Planning and Environmental Portfolio Committee [PEPCO] where my motion on coastal development was addressed. PEPCO agreed to nodal development (Monwabisi, Mnandi, Blue Water and Strandfontein). Though the planners are busy with the Kapteinsklip/ Mnandi Precinct, it will take another battle of a lifetime for the Planning department to address our other nodes. The process of coastal development seems to stagnate within the Planning Department of the City and needs to be addressed. Racial spatial patterns will result in further ruinous and dubious architecture and we will still be the victims.'

The approval by Council on the 1st June 2010 to proceed with the planning for coastal nodal development elicited the following remarks in the same letter:

'Mr Penxa I need answers by the 15th of December [2010] as to how much of the R103 million has been spent thus far; continuous follow up meetings from January 2011 for you to come up with a turnaround strategy that will mainstream economic development on our coastline, strengthening of initiatives that will benefit the local people and to further promote inter-governmental planning around the City's IDP [Integrated Development Plan] to give impetus to the above pointers with regards to the development of the False Bay coastline.

*Yours,
Danny Christians'*

This correspondence brings to the fore several themes in addition to the development imperative. Dated the 6th of December 2010, it suggests that the spatial legacy of apartheid planning in South Africa is still omnipresent 14 years after South Africa's transition to democracy. Certainly, progress in diffusing and integrating communities remains an arduous and sluggish process. Progress with the nodal developments of Monwabisi, Mnandi, Blue Waters and Strandfontein referred to in the correspondence has, to date, been limited to a superficial level of planning assessments and pre-feasibility studies with any form of physical nodal development yet to have taken place. In a sense, South Africa's past, is still present. The frustration surrounding this slow transition is justified given that Cape Town's coastline not only underpins its economy⁴, but is central to its identity⁵, global desirability and sense of place (Oelofse, pers. comm., September 22, 2016). The letter drafted by Councillor Christians highlights the value of South Africa's coastal resources in pursuing a more 'modernized' state for previously isolated and excluded communities that still languish in the poverty trap. Certainly, the value and the ability of the coast to contribute to socio-economic upliftment is well founded and needs to be dogmatically pursued. It also strengthens the notion that coastal governance is an inherently political endeavour (Glavovic et al., 2015).

The political dynamic and the need to promote both restorative and distributive justice are central features in the governance of South Africa's coastal environment. There are also emerging pressures which are adding to the complexity of governing the transitional space between land and sea masses. These include intensifying hazards associated with a warming climate, namely sea-level rise, storm surges, altered wave climates, coastal erosion and shifting wind regimes. Thus two converging pressures become evident: that of advancing coastal development in pursuit of a more modernized state and advancing hazards such as sea-level rise associated with a warming climate. The latent and discreet nature of the impacts of eustatic sea-level rise gives advantage to the pursuit of inappropriate and risky development in the short term, while simultaneously weakening the argument for forward, proactive planning initiatives designed to promote risk averse, and sustainable development in the long term. Be that as it may, a distinctive dichotomy has

4 An economic assessment determined that Cape Town's coastline contributes approximately 40 billion Rand per annum, which amounts to $\pm 10.7\%$ of Cape Town's GDP/annum (Urban-Econ, 2017).

5 As a crude proxy demonstrative of the 'identity' that the coastline gives Cape Town are the large portraits of Cape Town's coastline that adorn the halls and offices of the political principal and executive management at the apex of the decision making hierarchy of Cape Town.

emerged at the local level: how to achieve political imperatives of progressing to a more modernized state through inclusive development and promoting restorative justice, yet develop risk averse and resilient⁶ coastal cities and towns in the face of mounting climate change related pressures. Political interests, the high premium placed on coastal real estate and the uncertainties surrounding climate science, in particular the rate at which sea-levels are expected to rise, are some of the factors that makes this an especially difficult space to navigate and govern.

My positionality as a coastal policy practitioner working in local government locates me at the 'pressure point' between these two converging forces. Further, fulfilling the role of both governance actor as an employee within local government and a researcher embedded within my own subject matter has elicited much introspection on my own identity, knowledge orientation and world view. This introspection has been useful in understanding how my own positionality has shaped this research, the work that I do in terms of policy formulation and planning, and most importantly, how governance strategies and actions impact on other governance actors more broadly.

The Smorgasbord of dynamic and nuanced influences, all of which are born out of, and shaped by, the contextual and historical realities at the local level, as this research reveals, can elude international policy prescripts of best practice in the governance of coastal risk. Tending towards being apolitical, such prescripts are prone to being desensitized to the contextual realities of the local level (Peck, 2011). The contents and findings of this research are presented through a 'hybrid lens': that of a researcher, and that of an actor. It is hoped that the findings generated from this unique perspective on coastal governance at the local level uncovers veiled barriers and opportunities that stimulate a transition to alternative governance pathways in the coastal risk and climate change adaptation domain and that such pathways meet the social challenges of developing city-scale contexts.

6 The definition of resilience is taken from Folke (2006) which is the persistence or robustness of social systems in response to perturbations or shocks and understanding how social systems may (re)organize themselves in the face of uncertainty and change through drawing on institutional memory, and encouraging institutional reform both structurally and procedurally in responses to the changing world.

Executive summary

This research makes enquiries into the governance of coastal risk and vulnerability in developing city-scale contexts. Coastal cities, particularly in the global south, are increasingly recognized as places in which climate change risks coalesce and intensify (Celliers et al., 2007; Moser et al., 2012; Glavovic et al., 2015). Despite coastal cities being hubs rich in social capital and from which climate change adaptation efforts are most likely to be mobilized and given effect, coastal systems - as the transitional space between land and sea masses and where institutions and legislative frameworks converge and overlap - generally demonstrate low levels of governability (Cicin-Sain, 1998; Glavovic, 2006; Chuenpagdee et al., 2008; Kremer & Pinckney, 2012). It is the interplay between poor governability of coastal zones and coastal cities as disproportionately vulnerable spaces to coastal risk that forms the central theme of this research.

Coastal cities in South Africa, such as Cape Town, are experiencing a range of coastal pressures consistent with a warming climate. Notably this includes evidence of a receding coastline in certain areas, shifting wind regimes and more intense storms. Further, social and economic challenges facing South African cities have required that the state intervene to ensure greater redistribution of economic, social and environmental resources. Both pro-growth and pro-poor strategies have been adopted in South African cities to address the legacy of apartheid. However, pro-growth strategies have emerged as the dominant approach to city development and are shaping the manner in which cities are being planned and built (Houghton, 2010). Coupled with rapidly expanding urban environments and a high premium for sea-frontage real estate, coastal municipalities are entering uncharted waters. The coalescence of these socio-political and climate-change-driven pressures requires a governance approach that is adaptive and responsive. There are, however, impediments that are preventing the required governance shifts to match these dynamic and mounting pressures. Of significance is that these impediments are limiting the ability of local government in the uptake and mobilization of Integrated Coastal Management (ICM). This is a concern given the loci of local government at the 'coal face' of these pressures and that ICM is an increasingly acknowledged and applied management paradigm from which to enable climate change adaptation responses (Chemane et al., 1997; Tobey et al., 2010; Falaleeva et al., 2011; Celliers et al., 2013; IPCC, 2014a). It is these impediments in the context of the various pressures, the

causality behind such governance impediments and the identification of solutions to overcome such impediments that form the main topic of enquiry of this research.

Research questions

Impediments to alternative governance pathways in the coastal risk and vulnerability domain are resulting in a governance inertia and ensuing response failures. This, in turn, is amplifying risks over temporal and spatial scales, where such risks are increasingly spanning social, economic and environmental spheres. While there is literature that has extensively dealt with the theoretical value of ICM as a management instrument applied in the governance of coastal areas at regional scales (see Cooper et al., 2008), it has scarcely examined barriers and reasons for poor uptake of ICM at the local level, and what this means for the governance of coastal risk more broadly. This is an important topic for enquiry given that sea-level rise and storm surges in conjunction with rapid urbanization and the ‘fixing’ of coastlines, synonymous with urban settings, place cities and local government at the forefront of climate change impacts (Cartwright et al., 2012). To address these escalating pressures and to promote responsible governance, priority must be shifted to enabling ICM at the local level (Olsen & Christie, 2000). In view of this, the following main research question is presented:

What are the origins, contextual circumstances, conceptions and means of addressing coastal risk at the local level, and how does this relate to the prevailing modes of governance in a developing country context?

The main research question is supplemented by the following sub-questions:

- i. How is risk defined in the coastal governance arena (Literature)?
- ii. What is the relationship between governance structures as commonly utilized within local government, ICM and the production of coastal risks (Causality)?
- iii. How does the relationship between governance elements within local government enable or disable government in achieving its goals, specifically as it relates to the implementation of coastal adaptation strategies (Causality/Performance)?
- iv. How do governance elements external to local government shape and influence the implementation of coastal adaptation strategies and what are the implications thereof (Causality/Performance)?

- v. How do modes of governance influence the effectiveness of governing coastal risk at the local level (Causality/Performance)?
- vi. How can the design of coastal policy processes be improved to facilitate more responsive and inclusive modes of governance in the coastal risk and vulnerability domain (Design)?

Key theoretical concepts

In responding to these research questions framed in terms of causality, performance and design (Institutional Dimensions of Global Environmental Change, 1999-2005), it is necessary to set a foundation through defining and understanding the core concepts used throughout this research, namely 'governance', 'governance modes' and 'risk'. For the purposes of this research governance is defined as: 'the whole of public as well as private interactions that are taken to solve societal problems and create societal opportunities. It includes the formulation and application of principles guiding those interactions and care for institutions⁷ that enable them' (Kooiman & Bavinck et al., 2005, p.30). 'Governance modes' describe the nature of governance approaches in responding to challenges that may be presented by the system-to-be-governed (SG). Here modes are described typically as being self, hierarchical or co-governance. Self-governance refers to the ability of social entities to self-organise and to govern themselves (Kooiman and Bavinck, 2013). Hierarchical governance, although there may be some involvement by the market and civil-society, is predominantly carried out by the state. Conversely, co-governance takes place on a horizontal plane through state, civil society and the market, and is characterized by private-public partnerships, networks and co-management (Chuenpagdee, 2008). Given that social and political problems are characterised by their diversity, complexity, dynamics and cross-scalar interactions, Interactive Governance (IG) theory advocates that governance responses should not only be formulated by the state, but must be shaped and determined by the market and civil society respectively through modes of co-governance.

7 An institution consists of a set of norms and rules, which define and guide roles and procedures for people, determining actions that are appropriate, legitimate and proper (Homer-Dixon, 1999). Institutions may be formal, and informal. Formal institutions, for example, may be represented by government agencies, law enforcement agencies or legislative frameworks and tend towards having their rules enforced by a state actor. Informal institutions comprise rules that may be shared socially, influence behavior and which may be self-enforcing (Helmke & Levitsky, 2003). An organization is considered as an institution with an ordered and hierarchical means of coordinating activities, including the provision of services, in a collaborative manner, towards achieving a common goal (Eberle & Maeder, 2011; Giddens, 2001).

Risk is a function of both hazard and vulnerability. It is also a highly subjective term: risk to what, when, to whom, and in what form? Ulrich Beck, the founder of the theoretical framework referred to as 'Risk Society', considers risk as the likelihood of physical harm that may arise from technological or other processes (Beck, 1992). While Beck's seminal writings on risk society provide a useful platform from which to understand risk, this dissertation frames risk more expansively as anything that may pose a danger to people or to the things that people value (Kasperson & Kasperson, 2001). Marrying the two concepts of 'risk' and 'governance', 'risk governance' may be considered as 'the translation of the substance and core principles of governance to the context of risk-related decision making' (Van Asselt & Renn, 2011, p.431). This is a tricky business considering that not all risks can be calculated as a linear function between probability and effect (Van Asselt & Renn, 2011).

Beck's 'Risk Society' hypothesises that the pursuit of modernity via wealth creation through techno-scientific progress and development, is systematically, and consequentially, accompanied by the social production of risks (Beck, 1992). Witness the link between industrialization and climate change. Coastal cities in the post-modern era are, from this viewpoint, prominent exponents of a risk society. Certainly, and in the developing global south from a coastal governance perspective, the pursuit of modernity continues in the form of rampant coastal development and urbanization. This, in turn, is generating a new set of risks in addition to the climate risks already produced by industrialised or 'modern' societies. Within a risk society, threats and hazards no longer arise out of 'nature' but rather from the process of modernization itself (Beck, 1992). The magnitude of risk, through an increasingly modernized society, is as a consequence, becoming progressively created and affected by social systems that have the very task of controlling, or governing, risky activity (Beck, 1992).

Given the notion that the production of risk is no longer the exclusive purview of Mother Nature, but instead increasingly linked to, and generated by, those social systems charged with governing risk, the contribution of governance theory in limiting risk is implicit. Interactive Governance theory is applied in this research to understand the link between governance as a form of social organization, and the production of risks. Here IG is defined as a 'theoretical perspective that emphasizes the governing roles of state, market and civil society' (Kooiman & Bavinck, 2013, p.9). Interactive Governance is used in this research to explore the role of government as a key actor in responding

to converging pressures and risks of rapidly urbanizing coastal cities and advancing seas as a consequence of a warming climate.

Method frameworks

The questions presented in this research and the theories applied in responding to the research questions have been pursued through two main methodological frameworks, namely the Organizational Ethnography and Participatory Action Research (PAR) frameworks. These methods are considered the most appropriate frameworks given my positionality (see Chapter Two, section 2.2 for an elaboration on my positionality) and the topic of enquiry. An Organizational Ethnography is a multi-method framework whereby the researcher focuses on direct observation of the subject matter and recounts experiences within a particular organization as the basis for data generation. A PAR framework in turn focuses on the identification of problems or blockages that may be obstructive to improving human welfare and the identification and implementation of solutions to overcome such problems. As an employee within local government I consider myself a local government actor cum embedded researcher.

While a broader analysis of the coastal governance landscape in South Africa was undertaken, the focus of this research was directed at a local (municipal) government level. As I have been an employee of the City of Cape Town Local Government Municipality (CCT) for the last nine years, a large component of this research focuses on the CCT. This research has produced compelling findings that have challenged conventions of 'best practice' of coastal governance within the coastal risk and vulnerability domain in both Cape Town and South Africa more broadly. This action research has led to a range of positive outcomes. Within the CCT it has fostered dialogue between departments and political representatives on what it means to govern coastal risk, and what strategies and mechanisms are best equipped to develop a resilient coastal city. A key outcome of this was the development of a Coastal Management Line (CML) methodology that has departed from the convention of CMLs based exclusively on positivistic enquiry, to a CCT CML methodology that is founded on, and sensitized to, socio-political and economic imperatives. In so doing it has resulted in the development of a methodology that has progressed from the theoretical 'hazard' line to a CML that is practically implementable at the local level. Indeed it has resulted in the formalisation of the CCT's CML within the Spatial Development Framework as a key planning mechanism that determines urban form, typology and spatial growth patterns for the CCT.

This research has stimulated debate amongst government spheres – in particular the Western Cape Provincial Government - of both the importance of adopting a multi-disciplinary approach in developing CMLs⁸ and the value of engagement by government with civil society in the formulation of coastal adaptation strategies such as CMLs. The result of which has been improved buy-in from civil society with provincial government and thus improved likelihood of formalising CMLs for other coastal municipalities into the future. This research has also contributed to the stimulation of governance actions both within the CCT and between CCT, civil society and other spheres of government that frame risk as a shared responsibility between the state and civil society, as opposed to being a purely civil society burden. The product of which has been the development of a ‘round table’ forum from which to facilitate dialogue and engagement in the resolution of coastal erosion as a wicked problem in Cape Town.

Thesis structure

Chapters One and Two of this dissertation present the introduction and method statement respectively. Chapters Three, Four, Five and Six comprise articles. Chapter Three focuses on elaborating on conceptions of coastal risk, the influence of governing structures and organizational form on ICM, and how this may in turn lead to the production of coastal risks (sub-question i and ii). Chapter Four investigates how a poor ‘goodness of fit’ between governance elements within local government may lead to unanticipated conflict and resistance in formulating and implementing coastal adaptation strategies (sub-question iii). This is investigated through the lens of CMLs as widely prescribed and acclaimed socio-institutional responses to promoting risk averse, and sustainable coastal development (IPCC, 2014a). Chapters Five and Six investigate ‘externalities’ within the coastal governance landscape beyond the structural and jurisdictional limits of local government, but where these ‘externalities’ influence local government and their ability to effectively govern coastal risk. More specifically Chapter Five considers how different knowledge orientations held by different governance actors may influence and shape the governance of coastal risk as investigated through the lens of CMLs (sub-question iv). Chapter Six analyses the influence of national institutions (and their legislative frameworks) as well as how prevalent discourses may shape and influence modes of governance by government,

8 Prior to the amendment of the Integrated Coastal Management Act (No. 36 of 2014), Coastal Management Lines were referred to as ‘set-back lines’.

and what this means for the governance of coastal risk at the local level (sub-question v). Chapter Seven provides the conclusion, responding in detail to both the main research question and sub-questions. In so doing this chapter also makes prescriptions on how the design of coastal policy processes may better facilitate more responsive and inclusive modes of governance in the coastal risk and vulnerability domain (sub-question vi).

Responding to the research questions

Interactive Governance theory was used as the main theoretical framework from which to identify the impediments that exist in the governance of coastal cities within the coastal risk and vulnerability domain. Although cities have their own challenges and limitations internally as independent entities, they are nested within, and influenced by, exogenous governance and political forces. It is within this context that this research identifies four main impediments to the governance of coastal risk at the local level in South Africa.

The first impediment (see Chapter Three for a detailed analysis), and in responding to sub-question ii, relates to the nature of relations between governance structures as commonly employed within local government. Governance structures are designed to provide enabling conditions from which to achieve governance objectives, such as proficient delivery of basic services. A poor 'goodness of fit' between governance structures may however disable the action potential of governance actors, leading to a failure in achieving set objectives. In the context of a coastal city these discordant governance structures are represented as conventional (Weberian) forms of bureaucracy and collaborative platforms of engagement. Conventional forms of bureaucracy are characterized by three main traits, namely the dependence on rules and regulations, the division of labour (individual departments) and hierarchical channels of communication (Giddens, 2001). The procedural rigidities delivered by a bureaucracy are however dissenting to, and undermine, collaborative platforms of engagement. A problem arises when collaborative platforms of engagement are designed and established to promote the tenets of ICM, namely institutional learning, deliberation, flexibility and adaptive management. Conventional bureaucracy is obstructive towards achieving increased degrees of ICM which in turn has broader implications for the governance of Cape Town as a coastal city. In the case of the CCT, the disjuncture that exists between bureaucracy and those structures (collaborative forums) designed to promote ICM is limiting the CCT's own ability towards achieving coastal adaption strategies in praxis. This is

attributed to the deeply entrenched and immutable nature of bureaucracy which prevails over those principles enshrined by ICM. The ascendancy of bureaucracy is strengthened given the value and effectiveness of bureaucratic structures in achieving political interests, notably control and clean audits. Within the CCT, power lies with the political principal.

While bureaucracy is considered the only form of organization to effectively administer large scale social systems (Weber, 1946 cited in Giddens, 2001), in dynamic settings at the transitional space between land and sea masses where coastal cities are located (and thus require dynamic and adaptive modes of governance), such a form of rigid organizational structure can instead lead to a ‘pathology’: risks are created and their production perpetuated by the very bureaucracy charged with mitigating these risks. This results in an escalation of risks in time and space, where such risks are increasingly spanning social, economic and environmental spheres. The query of how to work within and improve existing bureaucratic forms of organization is an important topic given the universal orthodoxy instilled in bureaucracies and the increasing responsibility bestowed upon local government in responding to climate change induced and dynamic pressures. A more pertinent question within this context is posited: how to work around the limitations of bureaucracies as a ‘necessary evil’, rather than trying to change the structural tenets of bureaucracy, that of hierarchy, rules and specialization that are the mainstays of any large institution? In response to this query this research reveals the value, and effectiveness, of informal networks in making bureaucracies more permeable to the tenets of ICM, thus enabling stronger degrees of ICM *within* bureaucracies.

The success of informal networks within rigid governance structures such as those imposed by bureaucracies lies in their ability to foster personal relationships, and in so doing, create spaces for political suasion (Giddens, 2001; Simon & Leck, 2014). These networks enable ‘reverse flows’ of engagement, albeit informal, from the base of the hierarchy where autonomy is limited, to the political principal at the apex of local government. The effectiveness of this approach is attributed to the role that the political principal plays in allocating resources and supporting policy goals in responding to climate change pressures (Pasquini et al., 2015). Informal networks enable an increased filtration of ICM principles into the governance arena and ultimately encourages a governance mode that is more flexible and responsive to the contextual realities of the SG and dynamic pressures facing

coastal cities. The ability to affect governance modes that demonstrate an 'isomorphism' between the governing system (GS) and the SG in the coastal risk and vulnerability domain at the local level is not only influenced by rigid second order governance structures such as bureaucracy alone. In responding to sub-question iii, and revealing the second impediment (see Chapter Four for a detailed analysis) within local government, is the role of a poor 'goodness of fit' between governance elements.

Consisting of images (e.g. normative governance values such as participatory democracy), instruments (e.g. legislation to ensure the legitimacy of public participation processes) and actions (e.g. efforts to ensure governance is inclusive) that contribute to the GS, these elements need to be consistent, and aligned with, governance goals to enable the achievement of these goals (Chuenpagdee et al., 2008). A poor 'goodness of fit' between these elements, even within an autonomously functioning entity such as a municipality, increases the improbability of consensus in setting, and achieving, governance goals. Similarly, and following from Wood and Shearing (2007), differing mentalities, technologies, resources and institutional frameworks that exist within a particular government department may lead to different interpretations and applications of 'best practice'. The poor 'goodness of fit' and subsequent failed governance outcomes is revealed in this research where two municipalities (as the first two in South Africa to attempt to do so) experienced significant difficulties in establishing and implementing CMLs. While the development of CMLs was anticipated to be difficult and contested by the public sector, what was not anticipated was the intra-departmental resistance within the CCT. A more detailed analysis through the lens of an IG framework suggests that this should have been anticipated.

Here, differences in 'images' held between different departments make for subjective, and at times, competing policy interpretations. In the case of the CCT, such differences manifested as tensions between departments pulling in different directions in accordance with their own divergent images (based on their own specific knowledge orientations, judgments, perceptions, mentalities and ultimately their associated mandates) as to what constitutes a risk averse and resilient coastal city. These diverging images led to conflict between departments and ultimately delayed the formalization of the CML as an important adaptation intervention. Indeed, as with the difficulty in defining a consensual image as to what constitutes ICM (Chuenpagdee et al., 2008), a poor 'goodness of fit' stemming primarily from conflicting or

competing images between individual departments (linked to the division of labour due to bureaucratic form) as to what constitutes coastal risk governance and how to achieve it, is similarly evident. This is unsurprising given South Africa's diverse socio-economic and environmental challenges and where the resolution of these challenges has been bestowed upon municipalities and their respective departments, each with their own mandates. This resonates with Rittel and Webber's (1973, p.160) notion that '...a plurality of objectives held by pluralities of politics makes it impossible to pursue unitary aims'. The application of IG theory towards understanding the relationship between governance elements and how this may affect governance outcomes is useful in understanding, and possibly forecasting, likely resistance in the development of coastal adaptation strategies. This is of critical importance when formulating international or national policy prescripts of 'best practice'. Such prescripts would do well to factor in, and be considerate of, the difficulties associated with generating consensus within a governance plurality, even within local government institutions as relatively 'autonomous' units.

Given the variety of actors and the influence that interactions between actors may have across different levels and scales within the governance arena (between provincial, national spheres of government and civil society), the consideration of 'goodness of fit' between governance elements must be extended beyond the jurisdictional and structural limits of municipalities as individual entities. This more expansive framing is useful in revealing issues that are influential to local government and the business that local government conducts. Indeed, the extension of the principle of 'goodness of fit' to other levels of government revealed the third impediment (see Chapter Five for a detailed analysis) in the governance of risk at the local level. This impediment is framed in sub-question iv: 'How do governance elements external to local government shape and influence the implementation of coastal adaptation strategies and what are the implications thereof?'

As previously mentioned, government in South Africa is in the process of formalizing CMLs as an internationally, nationally and provincially prescribed best practice response to addressing risk from coastal hazards. While the responsibility of formalizing these CMLs rests with the state – specifically that of provincial government - the process of formulating them has been outsourced to the private consulting sector. The transfer of these responsibilities is symptomatic of a broader challenge in South Africa.

The state, owing to a lack of capacity within the field of sustainability science, is increasingly reliant on the consulting industry that now occupies much of this intellectual space (Glavovic, 2006; Oelofse et al., 2006). The determination of CMLs, for example, is now nested within the consulting coastal engineering discipline within the private sector. The ‘images’ of precision and ‘instruments’ of empirically orientated computer models held and applied by coastal engineers are in turn producing high-tech empirical methodologies that attempt to pinpoint areas at risk from sea-level rise, storm surges and coastal erosion and the subsequent positioning of CMLs in relation to these metrics. This approach, as shaped by ‘images’ and ‘instruments’ grounded in positivism, contributes *partially* to the governance of coastal risk. Reference to ‘partial’ is made based on the notion that risk is in itself a social construct: risk only enters ‘reality’ when it is cognized and then managed as part of a social process (Zinn, 2008). This assertion is made from a social constructivist perspective whereby society-environment interactions are revealed, and shaped by, environmental discourses (Hajer, 1995; Adger, 2001). Pedenowski (2003, quoted in Sutherland, 2016, p.41) argues that:

In a world with multiple realities of ‘nature’ that are constructed by diverse groups with differing motivations and access to power, decision making in environmental management can become a ‘contest’ over whose knowledge is ‘right’, or in Foucault’s sense of the word, whose knowledge can produce the most powerful claim to ‘truth’.

Responses to coastal risk and vulnerability in South Africa are shaped by a dominant environmental discourse that is orientated towards a specific knowledge base of positivistic enquiry (Colenbrander & Sowman, 2015; Desportes & Colenbrander, 2016). This resonates with Scott (2017) who suggests that knowledge generated from positivistic enquiry remains the dominant mode of knowledge production in the natural sciences (Scott, 2017). Yet this ‘knowledge regime’ advanced by a sector of powerful actors – the coastal engineering fraternity – is only but one form of knowledge held by a group of actors in the domain of coastal risk governance. There is tacit, community, lay, practitioner and expert knowledge that is equally important and necessary in the governance of coastal risk (Desportes & Colenbrander, 2016). Thus, as risks are socially created and selected, and with the knowledge that responses to managing these risks are shaped by powerful discourses, the development of CMLs at the local level requires an expansion beyond the exclusive reliance by the state on positivistic orientations of enquiry preoccupied with the numerical

modelling of physical hazards. To rely on an exclusive and myopic set of images and instruments generated, and held in place by a powerful group of actors, is parochial and leads to socially detached CMLs.

This dissertation presents the argument that what is required is a more inclusive and integrated approach grounded within and spanning localized social, cultural, economic, political and ecological intricacies of the coastal space in the formulation of adaptation strategies such as CMLs. This begins with legitimate engagement with a diverse set of actors in the coastal governance arena to harness alternative knowledges in responding to environmental challenges such as those presented by coastal hazards. Certainly there is an emerging literature that demonstrates scientific knowledge is no longer the only knowledge from which to construct responses to environmental challenges (Sowman et al., 2016). Different actors contribute different knowledges, all of which may be combined to formulate a more 'complete' knowledge set which is useful for setting governance goals and mobilizing cohesive governance responses (Hordijk & Baud, 2006; Van Ewijk & Baud, 2009; Lane et al., 2011; Pfeffer et al., 2013). In order to give effect to this, Whatmore and Landstrom (2011) propose that collaborative processes are established to encourage citizens and other stakeholders outside of government to engage with government upon those matters that affect them. Similarly, this process of deliberative engagement is useful in moving towards, and formulating a shared image of what the challenges are, and what appropriate responses should be.

Shifting to governance modes that enable more deliberative and inclusive forms of engagement with a wide range of governance actors is a key priority in the governance of coastal risk in South Africa. This shift is particularly important given South Africa's transition to a democratic state and the need to re-dress South Africa's injustices as imposed under the apartheid regime. Although principles of co-governance were drawn into the process of formulating South Africa's first coastal policy: the *White Paper on Sustainable Coastal Development* (Glavovic 2006); these principles have not been transferred to, nor applied, in the governance of coastal risk and vulnerability. Instead, the governance of coastal risk in South Africa, and presenting the fourth impediment (see Chapter Six for a detailed analysis), remains archaic and intensely hierarchical: a top-down, command and control mode of governance with little to no authentic engagement with civil society.

Counter-intuitively, and addressing the fifth sub-question, is the role of South Africa's National Integrated Coastal Management Act (ICMA) (Act 36 of 2014) in promoting and reinforcing hierarchical modes of governance in the coastal risk and vulnerability domain. As its name suggests, the ICMA is a legislative instrument that strives to encourage integrative and collaborative forms of governance, the intent of which is to achieve the objectives and values enshrined in the White Paper. However, provisions in this legislation as it relates to coastal risk and vulnerability are geared towards absolving the state from any liability in respect of damage to, or loss of, property from coastal hazards. This is a choice made by the state based primarily on affordability – the state cannot afford the protection or relocation of properties at risk to coastal hazards. The stance held by the state is reflected in provisions in ICMA that are 'isolationistic' – the burden of exposure to coastal hazards is placed exclusively on the shoulders of vulnerable property owners. These isolationistic provisions which are enforced by the state are in turn engendering a hierarchical mode of governance imposed by the state. Such a mode is not conducive to open and iterative dialogue with actors beyond the state and contradicts South Africa's Constitution (Act No. 108 of 1996) which focuses on human rights, equity and procedural justice amongst others. While avoidance of liability by the state may be considered a legitimate concern, the potential still exists to demonstrate good governance through proactively finding solutions to the challenge of properties exposed to coastal hazards through encouraging dialogue with civil society. While institutional platforms exist across all three tiers of government designed to promote co-governance in the resolution of the challenges presented by coastal hazards, representation by sections of civil society (that are directly exposed to coastal hazards) on these platforms is limited, if non-existent. As it relates to engagement with vulnerable communities, there appears to be an element of 'fear' held by government officials towards these communities. The result of which is the deliberate exclusion of representatives of civil society from attending, and contributing to, these platforms of engagement as convened by the state.

The hierarchical mode of governance is instead stimulating the development of dissonant discourses between the state and civil society in South Africa. These divisions and the lack of legitimate and authentic state-society interactions are proving to be obstructive to the required deliberative and participatory modes of governance at the local level. This mode of governance is also demonstrative of the influence of national institutions and associated

governance instruments on local level government as embedded within this larger governance landscape. Here compliance with the provisions of ICMA as nationally enforced legislation is causing a governance inertia across all three tiers of government. This inertia is attributed to the isolationistic provisions of ICMA (as it relates to coastal risk and vulnerability), the subsequent hierarchical modes of governance and a failure by the state to hold and encourage authentic engagement with vulnerable communities. This inertia is both compounding risk, and amplifying the tensions between the state and civil society. The accelerating pressures associated with sea-level rise and the inability to relocate vulnerable communities due to a lack of funding and the absence of policy frameworks to guide this process is further polarizing the state from civil society.

A key requisite to enable a governance mode that facilitates participatory democracy is to gain insight into the needs and interests of a diverse range of actors and to persistently include these actors in governance processes. The value of such an approach is realized through exposing the state to alternative images, perceptions, values and interests that, through inclusive deliberation, creates a more holistic knowledge orientation from which the state can propose and initiate more 'grounded' responses to the challenges presented by climate change. The current mode of governance set by the state in South Africa in the coastal risk and vulnerability domain is inimical towards achieving this. Given the proximity of local government to the unfolding tensions in the coastal risk and vulnerability domain, it goes without saying that the priority must shift to formulating participatory ICM programmes that focus on knowledge co-production, learning and engagement at the local level (Olsen & Christie, 2000). This however is no simple feat given the obstacles already presented: the existing, and immutable limitations imposed by inflexible structures of bureaucracy within local government, poor 'goodness of fit' of governance elements, the dependence of the state on the consulting industry biased to a specific knowledge orientation, and finally the role that national legislation plays in upholding a hierarchical mode of governance that is exclusively aligned to absolving the state from liability. In this instance government is clearly 'getting it wrong'.

The deficits exhibited by government leads to enquiries on who 'governs the governor'? It is this topic of enquiry that led to the formation of the sixth and final sub-question of 'How can the design of coastal policy processes be improved to facilitate more responsive and inclusive modes of governance in

the coastal risk and vulnerability domain?' Entering into a co-governance mode is useful to pull government *towards* a more responsive and equitable form of governance. At the same time this presents the conundrum raised by Rittel & Webber (1973, p. 120) whereby '...a plurality of objectives held by pluralities of politics makes it impossible to pursue unitary aims'. The inclusion of an expanded set of governance actors in governance processes may also lead to deficits in accountability: if everyone becomes accountable, nobody can be held accountable (Beck, 1992). At this point tensions become evident between promoting co-governance, ensuring that outcomes are based on consensual decision making without co-opting, and that accountability is ensured. A further challenge is how not to get lost in a governance plurality and become inert as a consequence of these tensions and multiple interests. Interactive Governance theory emphasizes the importance of principles that may serve as a compass to navigate the tensions that may exist between governance actors in responding to a societal problem (Kooiman & Bavinck, 2005). While no particular principle holds sway over another, IG advocates that 'interaction' is better than 'going it alone' (Kooiman & Bavinck, 2005). The development and elaboration of principles that guide governance interactions should in themselves be a product of such interactions (Kooiman & Bavinck, 2005). In the governance of coastal risk and vulnerability, a key set of principles must be orientated towards promoting distributive and intergenerational justice. At a first order level of governance this must materialize in, for example, the protection of coastal environments (specifically beaches) in the interests of the broader public (CCT, 2015; see Annexure B). Upholding such a principle in governance decision making is intended to promote the maximum benefit to the largest amount of people over the longest period of time. It is only through adopting and upholding such principles that the state is likely to have any success in navigating the tensions that are bound to arise among a wider spectrum of actors as enabled through co-governance.

It is advocated that the task of steering deliberations between a wider set of governance actors in striving towards such principles should lie with local government. Local government is considered the appropriate tier given its close proximity to risk and civil society, as well as being located at the interface between civil society and the other spheres of government. The position that local government occupies necessitates that local government must play a key role in guiding and mediating this process. This, however, is a voluntary process (local government is not legally mandated to do so), and is largely dependent upon the 'bureaucratic activists' within local government

to initiate this process. The role of local government in this process also emphasizes the importance of institutionalizing ICM in both structure and process at the local level. Institutionalizing ICM and the principles thereof at the local level as well as championing a co-governance approach are fundamental requirements to establish a mode of governance that is more responsive to the SG.

The impending multi-vehicle collision between hierarchical and inflexible modes of governance, lack of coherence within government, rapid urban growth in cities and the approaching super-tanker of sea-level rise (African Centre for Cities, 2013), necessitates an urgent reappraisal of South Africa's coastal governance strategies. The proximity of local government to the 'point of impact' places local government as a key actor in mobilizing efforts in the exploration of alternative governance pathways. In terms of improving governability of the SG *within* local government, principles must also be formulated to create enabling conditions from which local government may function with greater degrees of flexibility, autonomy and innovativeness. Given that coastal governance is an inherently political endeavour (Glavovic, 2013a), and that the political principal is a central actor in the formulation of meta-governance principles, local government officials must endeavour to expose the political principal to the deeply nuanced challenges in the domain of coastal risk governance. This again underscores the value of informal networking in lobbying the political principal to enable the required shifts. Given the relatively short term of political cycles, each with political representatives of differing agency, it becomes an on-going and adaptive task in perpetuity. Ultimately this responsibility of mobilising informal networks is a choice made by subordinate individuals within a particular organization. Without these 'bureaucratic activists' – those government officials that act as 'champions' through promoting innovative governing practices that actively establish informal networks as precursory groundwork for political suasion – systemic challenges within the risk governance arena are likely to prevail. Indeed, it must become the responsibility of the bureaucratic activist to develop, strengthen and expand these networks not only within local government, but between the different tiers of government as well as across the public-private sector divide for a more transformative change.

Samenvatting

Deze dissertatie onderzoekt het beheer (governance) rondom kwetsbaarheid (*vulnerability*) en klimaatgerelateerd risico (*coastal risk*) van kuststeden in ontwikkelingslanden. Kuststeden, met name in het Zuiden, worden steeds meer erkend als plaatsen waar de risico's van klimaatveranderingen samensmelten en elkaar versterken (Celliers et al., 2007; Moser et al., 2012; Glavovic et al., 2015). Ondanks het feit dat kuststeden rijk zijn aan sociaal kapitaal en de drijvende kracht vormen voor klimaatadaptatiebeleid, vertonen kustgebieden – als overgangsruimte tussen land en zee waar ook bestuurssystemen en wetgevingen overlappen – over het algemeen lage niveaus van bestuurbaarheid (Cicin-Sain, 1998; Glavovic, 2006; Chuenpagdee et al., 2008; Kremer & Pinckney, 2012). De wisselwerking tussen de moeizame bestuurbaarheid (governability) van kustgebieden en -steden en hun disproportionele kwetsbaarheid, vormt het centrale thema van dit onderzoek.

Kuststeden in Zuid-Afrika, zoals Kaapstad, ondervinden een scala aan problemen veroorzaakt door een opwarmend klimaat. Concrete voorbeelden hiervan zijn de terugtrekkende kustlijnen, verschuivende windregimes en meer intense stormen. Verder vereisen de sociale en economische uitdagingen van Zuid-Afrikaanse steden staatsinterventies die de herverdeling van economische, sociale en ecologische middelen garanderen. Zowel economische groei (*pro-growth*) als armoedebestrijdingsstrategieën (*pro-poor*) worden toegepast in Zuid-Afrikaanse steden om de sporen van apartheid te bestrijden. Het zijn echter de economische groeistrategieën die de overhand hebben gekregen in stadsontwikkeling (Houghton, 2010). De focus op economische groei in combinatie met stedelijke groei en de hoge premie voor onroerend goed aan zee, scheppen een onzekere toekomst voor kustgemeenten in het land. De samenhang tussen sociaal-politieke spanningen en klimaatsveranderingen vereist een bestuurssysteem dat flexibel is en snel kan inspelen op nieuwe ontwikkelingen en toenemende spanningen.

Er zijn echter belemmeringen die de overgang naar een adequaat bestuurssysteem verhinderen. Deze verhinderen onder andere het vermogen van de lokale overheid om een Integraal Kustbeheerssysteem (Integrated Coastal Management, ICM) te introduceren. Dit is problematisch aangezien de lokale overheid een directe insteek heeft in deze problematiek en ICM meer en meer wordt erkend en toegepast om adaptief klimaatbeleid mogelijk te maken (Chemane et al., 1997; Tobey et al., 2010; Falaleeva et al., 2011; Celliers et al., 2013; IPCC, 2014a). Om deze redenen vormen bestuurlijke belemmeringen, hun oorzaken alsook de mogelijke oplossingen, de kern van dit onderzoek.

Onderzoeksvragen

Verschillende factoren blokkeren de ontwikkeling van alternatieve bestuurspraktijken, zoals ICM, die beter in staat zijn om in te spelen op de toenemende druk op kustgebieden. Dit heeft inertie en gebrekkig beleid tot gevolg en verhoogt de kwetsbaarheid van kustgebieden op zowel sociaal, economisch als ecologisch terrein. Hoewel er veel studies uitgebreid ingaan op de theoretische waarde van ICM als bestuursinstrument (zie Cooper et al., 2008), is er weinig tot geen onderzoek gedaan naar de oorzaken van de beperkte toepassing van ICM op lokaal niveau en wat dit betekent voor het bestuur van kusttrisico's in brede zin. Dit is een cruciaal onderzoeksonderwerp aangezien lokaal bestuur als eerste de gevolgen zal ondervinden van klimaatsverandering (Cartwright et al., 2012).

Om de escalerende spanningen aan te pakken en verantwoord bestuur te bevorderen, moet het introduceren van ICM op lokaal niveau tot prioriteit worden gesteld (Olsen & Christie, 2000). Met het oog hierop wordt de volgende hoofdonderzoeksvraag gepresenteerd:

Wat zijn de oorzaken, contextuele omstandigheden, opvattingen en middelen om kusttrisico's (*coastal risk*) op lokaal niveau aan te pakken, en hoe verhoudt dit zich tot de heersende vormen van bestuur in de context van ontwikkelingslanden?

De hoofdonderzoeksvraag wordt aangevuld met de volgende deelvragen:

- i) Hoe wordt risico gedefinieerd in het domein van kustbeheer?
- ii) Wat is de relatie tussen bestuursstructuren die vaak door de lokale overheid worden gebruikt, ICM en de ontwikkeling van kusttrisico's?
- iii) Hoe kan de relatie tussen verschillende bestuurlijke elementen de lokale overheid in staat stellen of hinderen om haar doelen te bereiken, vooral als het gaat om de implementatie van kustadaptatiestrategieën?
- iv) Hoe bepalen bestuurlijke elementen op niveaus buiten de lokale overheid de implementatie van kustadaptatiestrategieën en wat zijn de implicaties daarvan?
- v) Hoe beïnvloeden verschillende bestuursstructuren de effectiviteit van lokaal kustadaptatiebeleid?
- vi) Hoe kan het ontwerp van kustbeleid worden verbeterd zodat het legitieme en inclusieve processen inzake kusttrisico's en kwetsbaarheid bevordert?

Conceptueel kader

Bij het beantwoorden van deze onderzoeksvragen, omkaderd in termen van causaliteit, prestaties en ontwerp (Institutional Dimensions of Global Environmental Change, 1999-2005), is het noodzakelijk de kernbegrippen van dit onderzoek te definiëren, namelijk: 'bestuur', 'bestuursvormen' en 'risico'. Voor de doeleinden van dit onderzoek wordt bestuur, ofwel *governance*, gedefinieerd als: 'het geheel van publieke en private interacties die worden ondernomen om maatschappelijke problemen op te lossen en maatschappelijke kansen te creëren. Het omvat de formulering en toepassing van principes die deze interacties sturen en zorgen voor instituties die deze interacties activeren' (Kooiman & Bavinck et al., 2005, p.30). Bestuursvormen (*modes*) omvatten de bestuursmaatregelen die genomen worden als reactie op uitdagingen gepresenteerd door het te beheren systeem (*system-to-be-governed*, SG). In dit onderzoek worden drie ideaaltypische bestuursvormen onderscheiden: zelfbestuur (*self governance*), hiërarchisch bestuur (*hierarchical governance*) en co-bestuur (*co-governance*).

Risico is een concept dat zowel op gevaar als op kwetsbaarheid duidt. Risico is ook een zeer subjectieve term: risico voor wat, wanneer, voor wie, en in welke vorm? Ulrich Beck, de oprichter van het theoretische raamwerk dat wordt aangeduid als '*Risk Society*', beschouwt risico als 'de waarschijnlijkheid van fysieke schade die kan voortvloeien uit technologische of andere processen' (Beck, 1992, vertaling auteur). Dit proefschrift omschrijft risico in brede zin als iets dat een gevaar kan vormen voor mensen of zaken die mensen waarderen (Kasperson & Kasperson, 2001). 'Risicobestuur', de combinatie van concepten 'risico' en 'bestuur', kan worden beschouwd als de vertaling van de inhoud en de kernbeginselen van bestuur naar de context van risico-gerelateerde besluitvorming (Van Asselt & Renn, 2011, p.431). Risicobeheer is een lastige onderneming omdat niet alle risico's kunnen worden berekend als een lineaire functie tussen waarschijnlijkheid en effect (Van Asselt & Renn, 2011). Beck's '*Risk Society*' veronderstelt dat het streven naar moderniteit via economische groei en techno-wetenschappelijke ontwikkeling, steeds gepaard gaat met de maatschappelijke productie van risico's (Beck, 1992). Ziehier het verband tussen industrialisatie en klimaatverandering. Kuststeden in onze postmoderne tijdperk zijn, vanuit dit standpunt, prominente exponenten van een risicomaatschappij. Binnen een '*Risk Society*' ontstaan zo bedreigingen en gevaren niet langer uit 'de natuur' maar eerder uit het proces van modernisering zelf (Beck, 1992).

Gezien het produceren van risico niet langer de exclusieve bevoegdheid is van Moeder Natuur, maar in toenemende mate gekoppeld is aan en gegeneerd wordt door de sociale systemen belast met het besturen van risico, is de bijdrage van bestuurskunde aan risicobeperking belangrijk. *Interactive Governance theorie (IG)* wordt in dit onderzoek toegepast om de link tussen bestuur als een vorm van sociale organisatie en de productie van risico's te begrijpen. Hier wordt IG gedefinieerd als een 'theoretisch perspectief dat de regisserende rol van overheid, markt en burgermaatschappij benadrukt' (Kooiman & Bavinck, 2013, p.9). In het bijzonder wordt IG in dit onderzoek gebruikt om de rol van de overheid als een belangrijke speler in het reageren op de spanningen en risico's van snel verstedelijkende kuststeden en oprukkende zeeën te onderzoeken.

Methodologisch kader

De onderzoeksvragen van deze zijn onderzocht binnen twee methodologische kaders, namelijk organisatorische etnografie (*organizational ethnography*) en participatief actieonderzoek (*participatory action research*, PAR). De keuze voor deze kaders is gebaseerd op mijn bijzondere positionaliteit (zie hoofdstuk twee, paragraaf 2.2) alsook op het specifieke onderwerp van dit onderzoek. Organisatorische etnografie is een kader waarbij de onderzoeker zowel directe observaties ten aanzien van het onderwerp als ervaringen binnen een bepaalde organisatie gebruikt als basis voor dataverzameling. Het PAR-kader richt zich op de identificatie van problemen of obstakels die het verbeteren van het welzijn van de mens in de weg staan alsook de identificatie en implementatie van oplossingen om dergelijke problemen te overwinnen.

Als medewerker van de lokale overheid in Kaapstad beschouw ik mezelf als een lokale overheidsactor evenals een 'ingebbedde onderzoeker' (*embedded researcher*). Hoewel ik tevens een bredere analyse van het landschap van kustbestuur in Zuid-Afrika heb uitgevoerd, was de focus van dit onderzoek gericht op het lokaal (gemeentelijke) overheidsniveau. Aangezien ik de afgelopen negen jaar medewerker was van de Gemeentelijke Gemeente van Kaapstad (CCT), richt een groot deel van dit onderzoek zich op de CCT.

Opzet van de dissertatie

Hoofdstuk één en twee van dit proefschrift bevatten de introductie tot het onderwerp en een beschrijving van de gevolgde onderzoeksmethodiek. Hoofdstuk drie, vier, vijf en zes bevatten vier zelfstandig gepubliceerde doch op elkaar afgestemde artikelen. Hoofdstuk drie richt zich op het uitwerken

van het begrip ‘kustrisiko’ (*coastal risk*), de invloed van bestuursvormen en organisatievormen op ICM, en hoe dit op zijn beurt kan leiden tot de productie van risico (deelvragen i en ii). Hoofdstuk vier onderzoekt hoe een zwakke samenhang (*goodness of fit*) tussen bestuurselementen binnen de lokale overheid kan leiden tot onverwachte conflicten en weerstand bij het formuleren en implementeren van kustadaptatiestrategieën (deelvraag iii). Dit wordt onderzocht door de lens van CML’s (*Coastal Management Lines*), een geprezen sociaal-institutionele kustadaptatiestrategie (IPCC, 2014a). Hoofdstuk vijf en zes onderzoeken ‘externaliteiten’ binnen het landschap van het kustbestuur, en richten zich dus buiten de structurele en wettelijke grenzen van de lokale overheid. Deze hoofdstukken analyseren waar deze ‘externaliteiten’ het vermogen van de lokale overheid beïnvloeden om kustrisiko’s effectief te beheersen. Meer specifiek gaat hoofdstuk vijf in op hoe de verschillende kennisoriëntaties van bestuursactoren het bestuur van *coastal risk* kunnen beïnvloeden en vormgeven. Dit wordt onderzocht met behulp van de lens van CML’s (deelvraag iv). Hoofdstuk zes analyseert de invloed van nationale instellingen (en hun wetgevende kaders) alsook hoe overheersende discoursen bestuursstructuren kunnen vormen en beïnvloeden en wat dit betekent voor het bestuur van kustrisiko’s op lokaal niveau (deelvraag v). Hoofdstuk zeven presenteert de conclusie, waarbij zowel de hoofdonderzoeksvraag als deelvragen in detail worden beantwoord. Hierbij geeft dit hoofdstuk ook aanbevelingen over hoe kustbeleid responsievere en inclusievere bestuursstructuren (deelvraag vi).

In antwoord op de onderzoeksvragen

Interactive Governance theory vormt het voornaamste theoretisch kader van deze studie en werd gebruikt om concrete belemmeringen te identificeren binnen het bestuur van kuststeden in het domein van kustrisiko’s en kwetsbaarheid. Hoewel steden hun eigen interne uitdagingen en beperkingen hebben, zijn ze ook ingebed en beïnvloed door extern gelegen bestuursstructuren en politieke krachten. In deze context identificeert dit onderzoek vier belangrijke belemmeringen in het bestuur van kustrisiko’s op lokaal niveau in Zuid-Afrika.

De eerste belemmering (zie hoofdstuk drie), gaat over de aard van de betrekkingen tussen bestuursstructuren binnen de lokale overheid. Bestuursstructuren zijn ontworpen om de juiste voorwaarden te scheppen voor het behalen van beleidsdoelstellingen, zoals bijvoorbeeld de optimale verstrekking van basisvoorzieningen. Een slechte samenhang tussen

bestuursstructuren kan echter de optimale werking van bestuur belemmeren, waardoor de gestelde doelstellingen niet gehaald worden. In de context van kuststeden, ondermijnen conventionele (Weberiaanse) vormen van bureaucratie het functioneren van collaboratieve samenwerkingsplatforms (*collaborative platforms of engagement*). Conventionele vormen van bureaucratie hebben drie hoofdkenmerken, namelijk: (1) de gebondenheid aan regels en voorschriften, (2) de taakverdeling (tussen individuele afdelingen) en (3) hiërarchische communicatiekanalen (Giddens, 2001). De procedurele stugheid van een bureaucratie is tegengesteld aan en ondermijnt het functioneren van samenwerkingsplatforms waarin institutioneel leren, overleg, flexibiliteit en adaptief bestuur centraal staan, tevens ook de basisprincipes van ICM. Met andere woorden, een conventionele bureaucratie belemmert het bereiken van verhoogde niveaus van ICM, wat op zijn beurt grotere implicaties heeft voor het bestuur van Kaapstad. In het geval van het CCT, beperken de spanningen tussen bureaucratie en de samenwerkingsplatformen, die zijn ontworpen om ICM te bevorderen, het vermogen van CCT om adaptiestrategieën te implementeren. Het overwicht van bureaucratische structuren wordt versterkt omwille van hun vermogen om politieke belangen te behartigen, met name door het uitoefenen van controle en *clean* audits. In deze context is een pertinente vraag hoe de beperkingen van bureaucratieën als een 'noodzakelijk kwaad' omzeild kunnen worden. In antwoord op deze vraag onthult dit onderzoek de waarde en doeltreffendheid van informele netwerken in bureaucratieën, waardoor een hogere mate van ICM *binnen* bureaucratieën mogelijk wordt.

Binnen rigide bureaucratieën, ligt het succes van informele netwerken in hun vermogen om persoonlijke relaties te bevorderen waardoor ze ruimte creëren voor politieke overreding (Giddens, 2001; Simon & Leck, 2014). Deze netwerken maken 'omgekeerde stromen' van (informeel) engagement mogelijk. Deze stromen starten vanuit de onderste laag van de hiërarchie, waar autonomie beperkt is, en reiken tot de politieke top van de lokale overheid. De effectiviteit van deze aanpak wordt toegeschreven aan de rol die het politieke primaat (*political principal*) speelt bij het toewijzen van middelen en het ondersteunen van klimaatbeleid (Pasquini et al., 2015). Informele netwerken maken zo een betere 'filtering' mogelijk van ICM-principes in bestuur en moedigen uiteindelijk een bestuursstructuur aan die flexibeler is en reageert op de contextuele realiteit van de SG en de spanningen waarmee kuststeden worden geconfronteerd.

Er zijn meerdere factoren die de samenhang tussen het bestuursstelsel (*governance system*, GS) en SG beïnvloeden. De rol van een zwakke samenhang tussen bestuurselementen komt naar boven bij het beantwoorden van deelvraag iii alsook de tweede belemmering (zie hoofdstuk vier). Bestuurselementen die bijdragen aan de GS, bestaande uit visies (bv. normatieve waarden zoals participerende democratie), instrumenten (bv. wetgeving om de legitimiteit van publieke participatieprocessen te waarborgen) en acties (bv. inspanningen om inclusief bestuur te waarborgen), moeten consistent zijn en afgestemd op de gestelde doelstellingen. Alleen dan kunnen deze doelstellingen gehaald worden (Chuenpagdee et al., 2008). Een slechte samenhang tussen deze elementen, zelfs binnen een autonoom functionerende entiteit zoals een gemeente, vergroot de kans op verdeeldheid bij het stellen en bereiken van vooropgestelde doelstellingen. In deze studie wordt een zwakke samenhang en bijgevolg niet gehaalde beleidsdoelstellingen, onderzocht in twee gemeenten die aanzienlijke moeilijkheden hadden in het opzetten en implementeren van CML's. Hoewel de publieke sector wel verwachtte dat de ontwikkeling van CML's moeizaam zou verlopen, voorzag ze de interne weerstand niet binnen CCT. Een meer gedetailleerde analyse suggereert echter dat dit had kunnen worden voorzien. In deze gevallen zorgden verschillen in 'visies' tussen afdelingen voor subjectieve en soms concurrerende beleidsinterpretaties. In het geval van het CCT, manifesteerden dergelijke verschillen zich als spanningen tussen afdelingen die verschillende richtingen uitgingen in overeenstemming met hun eigen visies (op basis van hun eigen specifieke kennisoriëntaties, oordelen, percepties, mentaliteiten en uiteindelijk hun bijbehorende mandaten) over hoe een risicomijdende en veerkrachtige kuststad eruit ziet. Deze uiteenlopende visies leidden tot conflicten tussen afdelingen en uiteindelijk vertraagde zo het formaliseren van CML's.

IG-theorie biedt een waardevol kader om de relatie te begrijpen tussen bestuurselementen en hoe dit bestuur kan beïnvloeden, en kan zo resistentie bij de ontwikkeling van kustadaptatie-strategieën mogelijk voorspellen. Gezien de verscheidenheid aan actoren en de invloed die interacties tussen actoren kunnen hebben op verschillende niveaus en schalen binnen het bestuurlijke arena (tussen provinciale, nationale overheidsniveaus en het maatschappelijk middenveld), moet de inachtneming van 'samenhang' tussen bestuurselementen worden uitgebreid buiten de wettelijke en structurele grenzen van gemeenten als individuele entiteiten. Deze meer uitgebreide omkadering van 'samenhang' is zinvol bij het aanduiden van kwesties die van invloed zijn op de lokale overheid en haar bestuur. Deze uitbreiding

van het ‘samenhang’-principe naar andere bestuursniveaus bracht de derde belemmering (hoofdstuk vijf) naar voren in het risicobeleid op lokaal niveau. Deze belemmering is geformuleerd in deelvraag iv: ‘ Hoe bepalen bestuurlijke elementen buiten de lokale overheid de implementatie van kustadaptatiestrategieën en wat zijn de implicaties daarvan?’

De Zuid-Afrikaanse overheid ziet CML's als internationaal, nationaal en provinciaal voorgeschreven voorkeursbeleid (*best practice*) bij het aanpakken van kusttrisico's. De bepaling van CML's is momenteel ingebed in het vakgebied *coastal engineering* bij adviesbureaus in de privé-sector. Deze ingenieurs maken gebruik van ‘precisiebeelden’ en empirisch georiënteerde computermodellen om zo *high-tech* methodes te ontwikkelen om risicogebieden aan de kust identificeren gebaseerd op zeespiegelstijging, stormvloed en kusterosie. Deze aanpak, gebaseerd op positivistische ‘beelden’ en ‘instrumenten’, draagt *gedeeltelijk* bij tot het bestuur van kusttrisico's. Het dominante milieudiscours dat het Zuid-Afrikaanse beleid rondom kusttrisico's en kwetsbaarheid vormgeeft, is gericht op een specifieke kennisbasis van positivistisch onderzoek (Colenbrander & Sowman, 2015; Depsortes & Colenbrander, 2016). Dit resoneert met Scott (2017) die suggereert dat kennis voortkomend uit positivistisch onderzoek de dominante manier van kennisproductie in de natuurwetenschappen blijft (Scott, 2017). Toch is dit ‘kennisregime’, dat door een sector van machtige spelers – de *coastal engineering fraternity* - wordt aangedreven, slechts één vorm van kennis. Er zijn andere soorten kennis, zowel impliciete kennis als die van de gemeenschap, vakmannen en experts, die even belangrijk en noodzakelijk is in de beleidsbepaling rondom kusttrisico's (Desportes & Colenbrander, 2016). Risico's worden namelijk gecreëerd en geselecteerd binnen een maatschappij die ook het beleid formuleert dat deze risico's moet beheersen. Dit proefschrift argumenteert dat er behoefte is aan een meer inclusieve en geïntegreerde benadering bij het formuleren van aanpassingsstrategieën zoals CML's die is gebaseerd op de lokale sociale, culturele, economische, politieke en ecologische complexiteit van kustgebieden. Dit begint met betrekken van verschillende actoren op het gebied van kustbestuur om zo ook alternatieve kennis te gebruiken bij het reageren op milieuproblemen aan de kust. Verschillende actoren met hun verschillende soorten kennis dragen zo bij aan een meer ‘complete’ kennis set die nuttig is voor het stellen van beleidsdoelstellingen en formuleren van samenhangend bestuur (Hordijk & Baud, 2006; Van Ewijk & Baud, 2009; Lane et al., 2011; Pfeffer et al., 2013). Om dit effect te bewerkstelligen, stellen Whatmore en Landstrom (2011) voor dat er samenwerkingsprocessen

worden opgezet om burgers en andere belanghebbenden buiten de regering aan te moedigen om met de overheid in gesprek te gaan over de zaken die hen aangaan. Deze onderhandelingen zorgen voor een gemeenschappelijk beeld over de verschillende uitdagingen en wat passende antwoorden zouden kunnen zijn.

De verschuiving naar meer deliberatieve en inclusieve vormen van bestuur die een brede betrokkenheid mogelijk maakt, is een topprioriteit in het beleid rondom kusttrisico's in Zuid-Afrika. Deze verschuiving is vooral belangrijk gezien de overgang van Zuid-Afrika naar een democratische staat en de noodzaak om de onrechtvaardigheden in Zuid-Afrika, zoals opgelegd door het apartheidregime, te corrigeren. Hoewel de beginselen van co-bestuur werden toegepast bij het formuleren van het eerste kustbeleid van Zuid-Afrika, het *White Paper on Sustainable Coastal Development* (Glavovic, 2006), werden deze principes niet overgedragen aan, noch toegepast, in het beleid ten aanzien van kusttrisico's en kwetsbaarheid. In plaats daarvan blijft het bestuur van *coastal risk* in Zuid-Afrika ouderwets en zeer hiërarchisch, een *top-down* beleid met weinig tot geen betrokkenheid van het maatschappelijk middenveld: de vierde belemmering (hoofdstuk zes).

De rol van de National Integrated Coastal Management Act (ICMA) van Zuid-Afrika (Wet 36 van 2014) bij het bevorderen en versterken van hiërarchische manieren van bestuur in het kusttrisico- en kwetsbaarheidsdomein is om bovengenoemde redenen niet voor de hand liggend – het vormt het onderwerp van de vijfde deelvraag. Zoals de naam al doet vermoeden, is het ICMA een wetgevingsinstrument dat geïntegreerde en collectieve bestuursstructuren moet bevorderen met als doel de waarden en doelstellingen in het bovengenoemde White Paper te behalen. Bepalingen in deze wetgeving met betrekking tot kusttrisico en -kwetsbaarheid zijn er echter op gericht om de staat vrij te stellen van elke aansprakelijkheid met betrekking tot schade aan of verlies van eigendommen door kustgevaren. Dit is een keuze van de staat aangezien zij zich de bescherming of verplaatsing van risicovol vastgoed niet veroorloven. De bepalingen in ICMA legt zo de last van kustgevaren volledig op de schouders van vastgoedeigenaren. Deze bepalingen zorgen op hun beurt weer voor een hiërarchisch bestuursvorm die door de staat wordt opgelegd. Zo'n bestuur is niet bevorderlijk voor een open en iteratieve dialoog met actoren buiten de staat en is in tegenspraak met de grondwet van Zuid-Afrika (wet nr. 108 van 1996), die zich onder meer richt op mensenrechten, gelijkheid en procedurele rechtvaardigheid. Hoewel

het vermijden van aansprakelijkheid door de staat als legitiem kan worden beschouwd, neemt dit niet weg dat er nog steeds het potentieel bestaat voor goed beleid rondom kustrisico's door de dialoog met het maatschappelijk middenveld aan te gaan. Het maatschappelijk middenveld is daarentegen zeer beperkt tot niet vertegenwoordigd in de institutionele platforms tussen de drie overheidsniveaus. In plaats daarvan stimuleert het hiërarchisch bestuur de ontwikkeling van dissonante discoursen tussen de staat en het maatschappelijk middenveld in Zuid-Afrika. Deze verdeeldheid en het ontbreken van interactie tussen staat en samenleving hinderen participatieve vormen van bestuur op lokaal niveau. Hier zorgt naleving van de bepalingen van ICMA voor een inertie van bestuur op alle drie overheidsniveaus. Deze inertie wordt toegeschreven aan de isolationistische bepalingen van ICMA (wat betreft kustrisico's en kwetsbaarheid) alsook het daaropvolgende hiërarchische bestuur en het falen van de staat om kwetsbare gemeenschappen betrekken in hun bestuur. Daarnaast versterkt deze inertie bestaande risico's en bestaande spanningen tussen de staat en het maatschappelijk middenveld. Daarbovenop wordt de kloof tussen de staat en het maatschappelijk middenveld vergroot door de toenemende druk van een zeespiegelstijging aan de ene kant en aan de andere kant het onvermogen om kwetsbare gemeenschappen ruimtelijk te verplaatsen vanwege een gebrek aan financiering en beleidskaders.

Inzicht verkrijgen in de behoeftes en belangen van een breed scala van actoren en deze consistent betrekken is een belangrijke vereiste om een participatieve democratie mogelijk te maken. De waarde van dergelijk beleid is dat het de staat bloot stelt aan alternatieve beelden, percepties, waarden en interesses die, door inclusief overleg, een meer holistische kennisoriëntatie creëren van waaruit de staat meer 'geaarde' antwoorden kan formuleren op de uitdagingen van klimaatsverandering. Het huidige staatsbestuur in Zuid-Afrika past dit niet toe in haar beleid ten aanzien van kustrisico's en kwetsbaarheid. Gezien de nabijheid van de lokale overheid bij de spanningen in het kustrisico- en kwetsbaarheidsdomein, spreekt het voor zich dat de prioriteit moet verschuiven naar het formuleren van participatieve ICM-programma's die gericht zijn op gezamenlijke kennisproductie, leren en participatie op lokaal niveau (Olsen & Christie, 2000). Dit is echter geen eenvoudige opgave gezien belemmeringen zoals hierboven beschreven: de bestaande en vastgeroeste beperkingen die worden opgelegd door starre structuren van bureaucratie bij de lokale overheid; een slechte samenhang van bestuurs-elementen; de afhankelijkheid van de staat van de adviesbureaus die wordt beïnvloed door een eenzijdige kennisoriëntatie; en ten slotte de rol die de nationale wetgeving

speelt bij het handhaven van een hiërarchisch bestuur dat de staat vrijspreekt van elke aansprakelijkheid.

De gebreken van de overheid leiden tot de vraag wie de overheid aansprakelijk kan stellen: *'who governs the governor?'* Dit is de vraag die leidde tot de formulering van de zesde en laatste deelvraag: 'Hoe kan het ontwerp van kustbeleid worden verbeterd om meer responsieve en inclusieve vormen van bestuur te faciliteren inzake kusttrisiko's en kwetsbaarheid?'. Schakelen naar een vorm van co-bestuur kan een meer responsief en rechtvaardig beleid stimuleren. Tegelijkertijd roept dit het raadsel van Rittel & Weber (1973, blz. 120) in gedachten, waarbij *'...a plurality of objectives held by pluralities of politics makes it impossible to pursue unitary aims'*. Het betrekken van vele verschillende actoren in bestuur kan ook leiden tot beperkte verantwoording: als iedereen verantwoordelijk wordt, kan niemand verantwoordelijk worden gehouden (Beck, 1992). Op dit punt worden spanningen duidelijk tussen het invoeren van co-bestuur, het verzekeren dat besluitvorming gebaseerd is op consensus zonder coöptatie, en het waarborgen van aansprakelijkheid. Een volgende uitdaging wordt dan het niet verdwalen in meervoudig bestuur en vast komen te zitten in inertie als gevolg van deze spanningen en uiteenlopende interesses. *Interactive Governance theorie* benadrukt het belang van principes die kunnen dienen als kompas om spanningen te besturen die kunnen bestaan tussen actoren in bestuur bij het reageren op een maatschappelijk probleem (Kooiman & Bavinck, 2005). Hoewel er geen specifiek principe voorrang heeft, pleit IG ervoor dat 'interactie' beter is dan 'er alleen voor gaan' (Kooiman & Bavinck, 2005). De ontwikkeling en uitwerking van principes die de interacties binnen bestuur sturen, moeten op zichzelf een product zijn van dergelijke interacties (Kooiman & Bavinck, 2005). Bij het bestuur rondom kusttrisiko's en kwetsbaarheid, moet een belangrijke reeks beginselen worden georiënteerd op de bevordering van distributieve en intergenerationele rechtvaardigheid. Op lokaal niveau moet dit leiden tot, bijvoorbeeld, de bescherming van kustgebieden (met name stranden) in het belang van bredere bevolkingslagen. Het handhaven van een dergelijk principe bij besluitvormingsprocessen heeft als doel om het grootste voordeel voor het grootste aantal mensen gedurende de langste periode te bevorderen. Het invoeren en handhaven van dergelijke principes is cruciaal voor de staat om te kunnen navigeren door de opborrelende spanningen tussen de verschillende actoren in een co-bestuurssysteem. De lokale overheid heeft zo een belangrijke rol in het intermedieren tussen verschillende spelers in bestuur aangezien zij een raakvlak vormen tussen het maatschappelijk

middenveld en de andere overheidsniveaus. Daarbij staat de lokale overheid ook het dichtste bij de risico's en bij het maatschappelijk middenveld. Dit is echter een vrijwillige aangelegenheid en afhankelijk van de handelingen van de 'activistische bureaucraat' binnen de plaatselijke overheid. Dit benadrukt nog eens het belang om ICM te institutionaliseren in de structuur en de werkwijze van de lokale overheid. Het institutionaliseren van ICM alsook het bevorderen van co-bestuursprincipes zijn fundamentele vereisten om een bestuursstelsel te creëren dat responsiever is ten opzichte van de SG.

De dreigende botsing tussen een hiërarchisch en inflexibel bestuur, een gebrek aan samenhang binnen de overheid, snelle stedelijke groei en een stijgende zeespiegel (Afrikaans centrum voor steden, 2013), vereist een dringende herziening van Zuid-Afrika's kustbestuur. Gezien haar nabijheid bij het 'impactpunt', is het lokale bestuur een belangrijke speler bij het mobiliseren van inspanningen om alternatieve bestuursstructuren te verkennen. Daarnaast moeten er ook principes worden geformuleerd die de bestuurbaarheid van de SG *binnen* de lokale overheid te verbeteren zodat de lokale overheid flexibeler, autonomer en innovatiever kan functioneren. Gezien het feit dat kustbestuur inherent politiek is (Glavovic, 2013a) en dat het politieke primaat een centrale rol speelt in de formulering van metabesturingsbeginselen, spelen lokale overheidsfunctionarissen een belangrijke rol in het naar boven halen van de genuanceerde uitdagingen in het bestuur van kustregio's. Dit onderstreept opnieuw de waarde van informele netwerken voor het lobbyen bij de politiek om de vereiste verschuivingen mogelijk te maken. Gezien de relatief korte duur van politieke cycli, elk met politieke vertegenwoordigers van verschillende instanties, vereist dit een voortdurende inspanning. Uiteindelijk is het mobiliseren van informele netwerken de verantwoordelijkheid van individuen in verschillende organisaties. Zonder deze 'bureaucratische activisten' - de regeringsfunctionarissen die optreden als 'voorvechters' door het bevorderen van innovatieve bestuurspraktijken die actief informele netwerken tot stand brengen als voorlopers voor politieke overreding – zullen systemische uitdagingen overheersen binnen het bestuur. Het moet de verantwoordelijkheid worden van de bureaucratistische activist om deze netwerken te ontwikkelen, te versterken en uit te breiden, niet alleen binnen de lokale overheid, maar tussen de verschillende lagen van de overheid en de publiek-private sector voor een meer transformerende verandering.

Chapter 1:

**Introducing theoretical
debates in the coastal risk and
vulnerability domain**

1.1 Setting the scene: the magnitude of coastal pressures

Coastal regions are the primary habitat for humanity: approximately 40% to 50% of the world's population live within 100km of the sea, with two-thirds of the world's megacities⁹ being located in the transitional space between land and sea masses (Agardy et al., 2005; Moser et al., 2012). While the coast provides valuable resources to promote and harness socio-economic development (DEAT, 2000; Hanson et al., 2011; de Wit et al., 2009), paradoxically, coastal risk attributed to climate-change-induced impacts such as sea-level rise and storm surges, is expected to increase into the future (Martinez et al., 2007, cited in Glavovic et al., 2015). Globally, it is estimated that 500 million people *already* live in urban centres within flood risk delta regions (Moser et al., 2012). While cities may have certain advantages in terms of responding to climate change and associated risks, it is possible that global and national targets for climate change mitigation will fall short of the goal to keep average temperature rise below 2 degrees Centigrade (Gupta, 2016). Even if greenhouse gas emissions were to be theoretically stopped with immediate effect, sea-levels would continue to rise until the next millennium (Washington et al., 2009; IPCC, 2013). Some argue that due to time scales associated with climate processes sea-levels would continue to rise for the next 1000 years (Solomon et al., 2009). This set trajectory leaves no other alternative than a fundamental transformation in the way coastal cities are planned, built and governed (Celliers et al., 2007; Chuenpagdee et al., 2008; Cartwright et al., 2012; Glavovic et al., 2015).

This research sets out to determine what form and direction innovative modes of governance would take, and how such forms could be mobilized to more effectively respond to these mounting risks and wicked problems at the city-scale. Enquiries into this topic are focused on South Africa as a single case study. Within South Africa, this research concentrates on two municipalities, namely the City of Cape Town Local Government Municipality (CCT) and the Overberg District Municipality (ODM). This analysis includes an investigation into provincial and national spheres of government which are central actors in the coastal risk and vulnerability domain. This chapter consists of the following sub-sections: Section 1.2 highlights the significant and escalating socio-economic and environmental challenges at the land-sea interface and how current governance approaches are failing to cope with the magnitude and complexity of these challenges. Section 1.3 identifies

⁹ Cities with a population of 10 million or more.

theoretical gaps in knowledge as it relates to the governance of coastal risk at the city-scale. Progressing from Section 1.3, Section 1.4 determines the main research question and sub-questions. Section 1.5 discusses the theoretical framework. Section 1.6 provides information on the case studies used in this research and finally Section 1.7 presents the broader structure of this dissertation.

1.2 Coastal cities: the loci of converging pressures

Coastal cities are being subjected to increasing pressures through both climatic and non-climatic stressors. Non-climatic stressors primarily emanate from the disproportionately high population densities and rates of growth within the world's coastal regions. By 2045 the world's urban population is expected to exceed six billion people: the highest rates of this growth will likely take place in African cities located in coastal regions (ICLEI, 2017). The age of the Anthropocene – where human impacts are precipitating environmental change – is resulting in a range of negative impacts across the socio-economic and environmental spectre. Land-based sources of pollution such as untreated sewage, plastic and agricultural run-off are increasing analogous to the growth in coastal populations. Land-based sources of pollution now account for 80% of marine pollution globally (UNEP-GPA, 2009; IOC/UNESCO, 2011). The discharge of pollutants to coastal systems has resulted in 'dead zones' - areas in which marine life can no longer survive (Diaz & Rosenberg, 2008; Breitberg et al., 2018). Up from 50 dead zones in 1950, today the estimated 500 dead zones cover an area of approximately 245,000 km² (Diaz & Rosenberg, 2008). Roughly 60% of the world's coral reefs and mangrove forests are considered degraded (Creel, 2003). Of significance to the loss of these systems is the regulatory function that they provide, in particular the buffering of inland areas from storm surges (WWF-SA, 2016). Ultimately, the wide-scale degradation of coastal ecosystems is leading to a loss of resilience in coping with environmental shocks and perturbations (Millennium Ecosystem Assessment, 2005; IPCC, 2007).

Declining resilience is compounding the effects of those pressures associated with climate change. In coastal contexts, sea-level rise and storm surges in conjunction with rapid urbanization and the 'fixing' of coastlines place cities at the forefront of climate change impacts (Cartwright et al., 2012; Glavovic et al., 2015). Advances in satellite technology and improvement of altimetry-based measurements to determine sea-level rise reaffirms the threats presented by sea-level rise (Goschen et al. 2009; Cazenave & Llovel, 2010).

Although eustatic sea levels have been rising at different rates over the last 20,000 years (Fairbanks, 1989; Harvey & Nichols, 2008), a warming climate as a consequence of anthropogenic influences is considered the likely driver behind accelerated rates of increase since the end of the 18th century (Church & White, 2011; Jevrejeva et al., 2008). Church and White (2011) estimate that the rate of global mean sea-level rise has almost doubled from 2.1 ± 0.2 mm yr⁻¹ in the last decades of the twentieth century to reach 3.3 ± 0.4 mm yr⁻¹ in the first decade of the twenty-first century. The IPCC Fifth Assessment Report estimates that sea levels will rise by between 9cm - 15cm by 2030, between 16cm - 32cm by 2050 and 28cm-98cm by 2100 (IPCC, 2013). These projections are founded primarily on the anticipated thermal expansion of the ocean and do not take into consideration the potential non-linear changes in ice-sheet melt or changes in weather patterns (Jevrejeva et al., 2008).

The rate of sea-level rise may differ on a regional scale due to influences in adjustments of landmasses, ocean dynamics and other regional or local phenomena such as currents, ocean temperatures and wind regimes (Goschen et al., 2009). Within South Africa, for example, the rate of rise on the west coast is different to that in the east. Mather et al. (2009) estimate that the sea-levels on the west coast are rising by $+1.87$ mm.yr⁻¹, the south coast by $+1.47$ mm.yr⁻¹ and the east coast by $+2.74$ mm.yr⁻¹. The variation in these levels are attributed to the differences in vertical crust movements between the east and west coasts of South Africa as well as the influence of different oceanographic processes occurring along the east and west coasts (Mather et al., 2009). A crude proxy reflecting the global extent of exposure to sea-level rise and associated impacts of storm surges, is that approximately 700 million people live within low lying coastal areas less than 10m above mean sea level (MSL) (UNDP, 2011). A study of 136 port cities around the world found that 40 million (0.6% of the global population) are at risk to a 1 in 100 year coastal flood event (Hanson et al., 2011). This return period of 100 years is expected to shorten as a consequence of rising sea levels (Brundrit, 2009).

Cooper and McKenna (2008) suggest that this scenario of increasing exposure to coastal hazards is resulting in a 'development-risk-protection' cycle: sea defence mechanisms are required to protect coastal communities. The construction of these sea defence mechanisms is, however, locking society into increasing, and ultimately unsustainable, costs. These costs are not only incurred directly through the construction and maintenance of sea-defences, placing pressure on the local economy, but also indirect

costs associated with the loss of beach and subsequently the amenity value (Cooper & McKenna, 2008; Pilkey & Cooper, 2014). This development-risk-protection cycle is becoming increasingly prevalent as a consequence of rising sea-levels, increasing frequency and intensity of storms (Villalba et al., 2009) and expanding coastal cities and the subsequent demand for more coastal land (Cooper & McKenna, 2008; Colenbrander et al., 2013). While urban hubs may be locked into the development-risk-protection cycle, the increasing prevalence of these cycles in less-developed coastal areas and the mal-adaptive impacts that emanate from such cycles bring into sharp focus governance decision-making as it relates to development in coastal regions (Colenbrander et al., 2013). The latent and often concealed nature of risk associated with eustatic sea-level rise is considered a key element in decision makers failing to pre-empt and mobilize pro-active and risk-averse adaptation strategies (see section 1.5.2 of this chapter for a further analysis of this). Thus governance decision making, and how decision making at the local level in the coastal governance arena is shaped and influenced, form a central thread throughout this dissertation.

The scale of converging pressures facing coastal cities presents a wicked problem. Wicked in a sense that the problem in itself cannot be defined definitively (Rittel & Webber, 1973). Similarly, when there is an intervention, it is difficult to determine whether the problem has been solved or not, and where the intervention in itself may generate other problems (Jentoft & Chuenpagdee, 2009). Solutions to wicked problems cannot be classified as true or false, but instead can only be defined more loosely as 'good' or 'bad'. The determination of whether the solution is 'good' or 'bad' or 'better' or 'worse' in turn rests with the ability of a multiplicity of actors and their own personal interests, value sets and world-views in collectively arriving at a consensus (Rittel & Webber, 1973). Here again the 'wickedness' is revealed in that a plurality of interests and objectives held by pluralities of politics makes it difficult to determine a collectively determined goal (Rittel & Webber, 1973). Take the phenomena of formally zoned residential areas where coastal communities are vulnerable to storm surges and sea-level rise. In such circumstances, it is difficult to determine accountability for exposure and vulnerability given that multiple factors can coalesce to lead to this exposure. These factors include climate change and sea-level rise, poor historic planning decisions spread across different tiers of government, political influence, disruptions to sediment budgets in seemingly unrelated areas and the 'downstream' impacts of such interferences. Without being

able to determine accountability, the task of finding solutions is made more difficult.

1.3 Where to from here: identifying gaps in literature

On a global scale, and backed by ongoing deterioration, governance of coastal zones remains a challenge (Cicin-Sain, 1998; Pauly et al., 2005; Glavovic, 2006; IPCC, 2007; Roberts, 2007; Chuenpagdee et al., 2008; Kremer & Pinckney, 2012). Typically characterized by sectoral and fragmented approaches especially in the developing world, the governance of these systems has led to institutional overlaps and ambiguities, competing rights, unclear responsibilities and accountability voids (Binns et al., 2003; Atkins, 2004; Williamson et al., 2005; McKenna et al. 2008). These implementation challenges still persist despite the global espousal of ICM as an acclaimed management paradigm from which to address these institutional deficits in the governance of coastal zones (Cicin-Sain, 1998; Chuenpagdee et al., 2008; McKenna et al., 2008; Kremer & Pinckney, 2012; Glavovic, 2015).

Integrated Coastal Management is being increasingly drawn into the discourse of coastal risk governance. Its recognition as a management paradigm from which to mobilize coastal adaptation strategies in response to the mounting risks and vulnerabilities associated with climate change in coastal contexts is testimony to this (Vellinga & Klein, 1993; Chemane et al., 1997; Bower & Turner, 1998; Nicholls et al., 2007; Sales, 2009; Tobey et al., 2010; Celliers et al., 2013). Given the loci of coastal cities at the ‘frontline’ of coastal climate risks, an emerging topic is the importance of institutionalizing ICM within local coastal government. There is a wealth of knowledge on stakeholder participation and co-production of knowledge within the field of coastal management. The importance of inclusive engagement with stakeholders across different tiers of government, in particular with local government, in the resolution of challenges unique to coastal regions is clearly articulated in literature (IMO/FAO/UNESCO-IOC/WMO/WHO/IAEA/UN/UNEP/GESAMP, 1996; Cicin-Sain et al., 1998; Olsen, 2003; Field, 2012). Inclusive within this literature are theoretical inroads as to the composition and functions of coastal governance structures to promote ICM at regional and national levels (Low Choy, 2006; Stuart et al., 2006). Dropping to the local level, Kiambo (2001) theorizes on the attributes that coastal managers should possess in order to promote ICM. In this he refers specifically to required skill sets, such as project management capabilities, familiarity with the tenets of ICM, conflict resolution, fundraising, research capabilities, etc.

A new frontier in knowledge acquisition relates to enquiries on how to formulate and establish participatory ICM programmes and institutional learning at the local level (Olsen & Christie, 2000). More specifically, and what does remain an elusive concept in the broad suite of ICM literature, is how institutions at the local level, which have a coastal governance competency, may be better organized and structured *within* themselves to promote the tenets of ICM – and by extension better govern coastal risk. This enquiry may be expanded further through considering the link between formal institutional form and ICM, and how the relationship between the two may influence the ability to govern. Formal institutional form includes aspects such as structuring and positioning of departments in relation to each other, vertical and horizontal configurations between strategic and operationally orientated departments, setting appropriate degrees of autonomy at operational levels as well as identifying internal processes and channels of reporting and communication. The consideration of the relationship between formal institutional form at the local level and ICM is important on three fronts. Firstly, there is a gap in knowledge on this topic of enquiry. Secondly, coastal cities – as representative of local government - have substantial and intricate governing systems in place that shape the nature and ability to perform coastal management and adaptation responsibilities which determine the success in responding to contemporary and escalating pressures associated with climate change. Thirdly, institutionalizing ICM within local government is necessary for facilitating modes of co-governance between the state and civil-society. A co-governing mode is a prerequisite for enabling procedural justice as a normative principle within the IG framework (Sen, 2011). This is an essential principle in post-apartheid South Africa.

Theories in the domain of organizational or institutional structure are limited to those more ‘mainstream’ sectors such as higher education and health (Jacobs et al., 2002; Burdow & Evers, 2010). Literature on organizational design and processes *within* institutions with the view to enabling and strengthening the ICM at the local level remains very limited. Although research conducted by Celliers et al. (2015) revealed institutional reforms as required to improve ICM within the CCT, attempts at initiating such reform by the CCT’s Environmental Resource Management Department – the loci of coastal management at the time - came up against a number of unforeseen barriers. Indeed it was the process of encountering these barriers that led to the identification of a second knowledge gap: what are the impediments to organizational re-design with the intent to institutionalize ICM (whether in

structure or process) within local government, and how do these institutional deficits relate to ICM and coastal risk? Moser et al. (2012) intimates that given the scale of the pressures facing coastal cities, change towards more adaptive and responsive forms of governance must extend beyond just incremental and piece-meal change and must be systemic and transformative. Although there is a rapidly expanding body of knowledge in the field of climate change adaptation at the city-scale, the clarion call for the mobilization of adaptive and innovative forms of governance has not resulted in the broad-scale and systemic change in practice (McKenna et al., 2008; Taylor, 2016). The loci of coastal cities in the transitional and dynamic space between land and sea masses requiring adaptive modes of governance pre-supposes that ICM would be employed as a key governance instrument at the local level (Celliers et al., 2015). Yet it is still rare to find examples of local level governments that have been, or are in the process of, self-organizing themselves with the explicit intent of mobilizing ICM as a pre-cursor to more adaptive and deliberative modes of governance (Celliers et al., 2015).

Governance approaches to address coastal vulnerability that do not consider principles of procedural justice are considered to be inherently flawed and patently unsustainable (Marinet, 2005; Cooper & McKenna, 2007; Glavovic, 2014). The concept of 'procedural justice' is debated in a vast theoretical body and forms the subject of a number of seminal writings (see section 1.5.5). Procedural justice also forms one of the central meta-governance principles as enshrined in South Africa's Constitution (Act No. 108 of 1996). The determination of what is required to achieve social justice in practice, which encompasses procedural, distributive and restorative justice, must be hatched from broadly consultative processes. Broadening participation with stakeholders across the state-civil society divide in formulating responses to societal challenges is a key requisite for ensuring equity in both process and outcome. A central principle of ICM is the promotion of open and transparent deliberative processes with a wide spectrum of governance actors in moving towards consensus in governing coastal zones. It is at this point that the sparse literature on institutional structure at the local level for enabling ICM as the most appropriate paradigm from which to encourage state-civil society interactions in formulating just and inclusive strategies in post-apartheid South Africa becomes appreciated. This topic of enquiry is also important from the perspective that challenges associated with inclusive policy formulation relate to institutional design, and not so much to the idea of deliberative engagement in itself (Hajer, 1995). Theoretical enquiries into this topic are considered a

necessary pre-cursor for enabling innovative policy and governance responses required to confront the challenges facing coastal cities, especially where coastal governance remains state-centric and sector focused.

A key issue presented in this research is the disjuncture that exists between policy and practice (see Chapter Four). My positionality and the focus of this research on the governance of coastal risk at the local level has magnified this issue and, through a number of case studies, reveals the gulf between what is prescribed in policy, and what is achievable in practice at the local level. In responding to this problematic, Peck (2011) posits the notion that there is a need for multi-scalar 'cross-pollination' between international and local levels in formulating policy prescripts used to guide responses towards contemporary pressures such as those associated with climate change. This assertion is made on the basis that stronger and one-directional efforts in forming policy prescripts at the international level do not automatically translate into substantive and rapid change at the local level (Field, 2012). Policy prescripts emanating from international, national or even local levels are also prone to underestimating the nuances that surround complex, politically contested cities and the institutional idiosyncrasies unique to them (Resnick et al., 2012). This together with an inherently 'individualized' context of each and every institute as a unique and autonomous entity at the local level (such as a municipality) means that policy prescripts risk becoming broadly sweeping statements that are abstract, irrelevant and detached from the local level. Further, such prescripts are largely taciturn on *how* such entities may transition from a state of undesirability – in terms of governance - to a desirable state given the plurality of competing interests and politics that are unique to each of the governing institutes.

Peck (2011) emphasizes the problematic of policy formulation at international and national levels that are preoccupied with the rational identification of 'best practice'. Instead, emphasis should be directed towards enabling policy mutation that is more responsive and attentive to the 'socio-spatial' contexts of 'dynamized institutional landscapes' (Peck, 2011: p.2). Theoretical contributions in this domain are considered especially valuable given that mainstream knowledge as it relates to climate change adaptation emanates from the global north, where such knowledge is produced by 'experts' and scientists that are considered detached or 'upstream' of decision making at local levels (Ziman, 2000). The policy transfer dilemma and the conversion of prescripts of best practice into practice at the local level is demonstrated when examined through the lens of implementing CMLs. Coastal Management Lines (see Chapter Four

and Five for a detailed description of CMLS) are internationally recognized and widely prescribed socio-institutional responses used to mitigate against, and adapt to, the risks posed by coastal hazards, such as storm surges, sea-level rise and coastal erosion (Cambers, 1998; Fenster, 2005; Schwartz, 2005; Sano et al., 2008; Winckel et al., 2008; Theron et al., 2010; DEA, 2014; IPCC, 2014a). The case studies of two municipalities (CCT and ODM) used in this research (Chapter Four and Five) reveal that their implementation, despite being based on widely advocated policy prescripts, remains problematic.

To date the policy prescripts of CMLs for these two municipalities, as with all the other coastal municipalities in South Africa, remain un-implementable, and as a consequence, incapable of achieving what they were originally designed to achieve. This failure emphasizes the policy-practice gap. Whist Peck (2011) calls for policy mutation that is responsive and attentive to the nuances of individual institutions that such policies target, the process of how to shift from transfer to 'mutation' which is contextualized to the local level lies largely unanswered. This gap in literature is felt acutely in contexts where capacity constraints are evident at local levels, and where policy prescripts are 'fed down' the hierarchy from positions unfamiliar with, and detached from, the realities of local level governance. It is the transfer of policy to the local level in the context of formulating coastal adaptation strategies that this research aims to contribute to. Importantly, it also discusses the nature of policy prescripts in the coastal risk and vulnerability domain, the drivers that shape these prescripts and what this (the nature of policy) means for the governance of risk and vulnerability at the local level.

Shifting from the policy-practice gap towards matters surrounding the practical implementation of coastal adaptation strategies, this research reveals that while there is ample literature on the application of the natural sciences in the formulation of CMLs, literature on how to incorporate socio-political and economic dimensions into the determination of CMLs is a much-needed addition (Schoonees et al., 2008; Theron & Rossouw, 2008; Smith, 2010). Further, there is scant literature on what *processes* may be applied in garnering different knowledge orientations in defining CMLs and how to engage with civil society in their implementation. This field of enquiry again links back to the broader theme of the role that ICM and co-governance can play at the local level as a means to facilitate these processes. It is anticipated that without this important contribution to literature, the challenges surrounding CMLs will prevail, and will remain un-implementable. The issues surrounding CMLs and

the inability to implement them are symptomatic of much broader governance challenges within the coastal risk and vulnerability domain in South Africa. Interactive Governance theory advocates that social and political problems are characterized by their own diversity and complexity. Thus it is the intention of this research to contribute to literature in terms of revealing barriers to more responsive forms of governance, and what is required to overcome these barriers for more effective governance within the coastal risk and vulnerability domain.

1.4 Research questions

The gaps in literature presented in section 1.3 have required the formulation of a number of research questions to address these gaps. Through these topics of enquiry this research will contribute to theories in these specific areas within the broader rubric of coastal risk governance at the local level. In this regard the main research question is presented as:

‘What are the origins, contextual circumstances, conceptions and means of addressing coastal risk at the local level, and how does this relate to the prevailing modes of governance in a developing country context?’

The main research question is further broken down into six sub-questions. They are as follows:

- i. How is risk defined in the coastal governance arena (Literature)?
- ii. What is the relationship between governance structures as commonly utilized within local government, ICM and the production of coastal risks (Causality)?
- iii. How does the relationship between governance elements within local government enable or disable government in achieving its goals, specifically as it relates to the implementation of coastal adaptation strategies (Causality/Performance)?
- iv. How do governance elements external to local government shape and influence the implementation of coastal adaptation strategies and what are the implications thereof (Causality/Performance)?
- v. How do modes of governance influence the effectiveness of governing coastal risk at the local level (Causality/Performance)?
- vi. How can the design of coastal policy processes be improved to facilitate more responsive and inclusive modes of governance in the coastal risk and vulnerability domain (Design)?

The first sub-question attempts to uncover and understand conceptions of coastal risk, and based on these conceptions, understand the nature of risk i.e. how, and in what form, does risk manifest within both temporal and spatial dimensions. The second question aims to un-pack the relationship between governance structures and ICM within local government, and how this relationship may lead to the production of risk. The third query also directs its focus on the internal workings of local government. Here the nature of the relationship between governance elements is explored in terms of its ability to either create an enabling or disabling environment in the formulation and application of coastal adaptation strategies. The fourth question takes an 'external' focus examining the role of elements from a broader (national and provincial) governance perspective and how these elements may influence local government in their implementation of adaptation strategies. The fifth question leads to inquiries on governance modes, what drives a particular mode of governance and what are the implications of hierarchical or state-centric modes of governance in the coastal risk and vulnerability domain. The sixth and final sub-question considers how coastal policy processes may be improved to address the policy-practice gap, and how such processes may also promote a transition to a more desirable mode of governance in the coastal risk and vulnerability domain. For each of the above queries I draw from a range of theoretical frameworks that are introduced in the following section.

1.5 Theoretical framework

In order to theorize on the governance of risk and how alternative pathways of governance may be mobilized, I will be drawing from four main theoretical bodies. The overarching theoretical body applied to this research, and to which this research makes theoretical contributions, is that of Interactive Governance theory. Interactive Governance (IG) has traditionally been applied to the fisheries sector (Kooiman, 2003; Kooiman et al., 2005). Breaking from the convention of applying IG to fisheries, this research applies the IG framework to better understand the governance of coastal risk and vulnerability, particularly in the context of urban governance in coastal areas exposed to pressures associated with climate change. The second theoretical body relates to conceptions of risk and the relationship between risk, hazard and vulnerability. Risk is examined through Beck's Risk Society, particularly relevant in developing country contexts where risk is closely tied to the pursuit of modernity and social upliftment through wealth production. Modernity, reflexive modernization and sustainable development are considered as

'sub-frameworks' within Beck's Risk Society. 'Risk' and 'governance' thus form the central threads throughout this dissertation. The third body of knowledge, and synonymous with government, is bureaucracy. The universal orthodoxy instilled in bureaucratic forms of organization, particularly within government institutes, warrants a detailed analysis and forms a significant contribution to this research. This research focuses on local level government located, in geographic terms, at the transitional space between land and sea masses. The loci of cities and the escalating pressures associated with climate change in coastal contexts necessitate a theoretical enquiry into Integrated Coastal Management (ICM) and climate change adaptation at the city-scale. Here 'management' differs conceptually from governance in that it is '...the processes of decision making, coordination and resource deployment that occur within a given institutional setting assuming no change in rules and norms' (Hatfield-Dodds et al., 2007, p.3). Integrated Coastal Management is seen as a specific management paradigm nested within IG. Finally, this dissertation draws from theoretical notions of procedural justice, a widely held proxy for gauging the success of governance responses in relation to climate risks and how addressing social and ecological issues can help enhance sustainable and equitable development. As this research focuses on the governance of risk, it is appropriate to commence with first understanding what risk is.

1.5.1 Framing risk, vulnerability and hazard

'The centre of risk consciousness lies not in the present, but in the future' (Beck, 1992, p.34)

Risk, vulnerability and hazard are terms that are used throughout this dissertation. As such it is necessary to introduce these concepts early in the script. Beck (1992, p.4) defines risk as '...the probabilities of physical harm due to given technological or other processes'. Kasperson and Kasperson (2001) define risk as anything that may pose a threat to people or things they value. Defining risk may continue *ad infinitum*, given that risk is a highly subjective concept: risk to whom, when, and in what form? Framing risk in a broader context as per the Kasperson and Kasperson (2001) definition is considered more useful and as such will be used as the reference point throughout this dissertation.

Risk, vulnerability and hazard are interrelated concepts. Risk is a function of both hazard and vulnerability. Hazard takes the form of causal elements that are typically biophysical in nature, including phenomena such as droughts,

fires, earthquakes, floods, storm surges and sea-level rise. Hazards may also be described in terms of magnitude and probability of occurrence (Pistrika & Tsakiris, 2007). Vulnerability relates to the level of exposure of social, political, economic or environmental systems to a particular hazard, or from the coalescence of a range of hazards (IPCC, 2014a). Vulnerability may also be influenced by structural and institutional characteristics of organizational or social systems. For example organizations or social systems that display adaptive capacity are more equipped to respond to, and cope with, environmental shocks and perturbations (Gupta et al. 2010). Social systems or organizations that are less fluid when exposed to environmental shocks are more vulnerable (Holling & Meffe, 1996). Similarly, the IPCC posits the notion that there is a strong correlation between levels of development, as measured both through income per capita and institutional maturity of social systems, with that of vulnerability (IPCC 1996). Institutions play a central role in protecting financial, human, social and natural capital of both households and individuals (de Haan & Zoomers, 2005) and are important in self-recovery after a disaster (Moser, 1998). Developed societies with access to financial resources such as insurance are more able to absorb the impacts of disasters such as fires or flooding than those without insurance. Here the vulnerability of socio-economic systems is tied to economic circumstances and the strength of the institutional landscape. In this regard developing countries tend to exhibit greater degrees of vulnerability than developed countries (IPCC, 2014b).

Adger (2001) presents the argument that the relationship between vulnerability and developmental status is less linear. Instead, vulnerability is determined by a complex set of economic, social and institutional factors that are loosely, or completely unrelated to, indices of income per capita. Understanding the drivers behind vulnerability may be further clouded given that environmental risks may manifest via multiple pathways, both temporally and spatially, leading to 'multiple exposures' in different forms (Leichenko & O'Brien, 2002; Cartwright, 2009). Further, social systems – including institutions - produce their own risks (Beck, 1992). Beck (1992) suggests that the scale at which risk is increasingly being generated by institutions is leading to what he calls a 'Risk Society'.

1.5.2 Risk Society

Before a theoretical analysis is provided on the concept of a Risk Society and how it relates to this research's inquiries, it is useful to 'step back' and consider modernization theory as a useful pre-cursor. A brief foray into modernization theory reveals its linkage with that of Beck's Risk Society. Modernization theory provides an explanation of the social variables that lead to evolutionary change of society over time. Modernization itself describes this change as a transition from traditional or 'pre-modern' society to a modern or advanced society that is typically urbanized and/or industrialized (Kendall, 2012). Modernization theory is useful for describing countries seeking to become developed, which is viewed as being synonymous with wealth creation and social upliftment. While the transition from pre-modern to modern states may in theory be achieved by alternative routes, there are no counter examples that sufficiently explain this process other than through the theory of modernization (Kendall, 2012). The 'accomplishment' of a modernized state and the subsequent societal advancement requires the simultaneous progression of governance principles where the evolution of these principles requires a departure from traditional religious beliefs and cultural traits towards 'rationality' and rational decision making (Beck, 1992). This transition in pursuit of more clearly and collectively defined goals also requires corresponding shifts in social forms of organization. Here bureaucratic forms of organization, the embodiment of rational decision making, emerged as an inevitability and a hegemonic form of organization within modernizing societies (Beck, 1992). The relationship between bureaucratic forms of organization and risk is further dissected in section 1.5.3.

Beck (199) argues that advanced modernity and the production of wealth is systematically accompanied by the social production of risks. Beck refers to this phenomenon as a Risk Society, presenting the argument that modernity is coextensive with industrial society, and an industrialized society leads to the exponential production of hazards and risks. Here a 'wealth-distributing' society – such as those capitalist free market economies - begins to join forces with that of a 'risk distributing' society. This hypothesis is useful in understanding risk in broader contexts, where for example the neo-liberal agenda and subsequent market-driven economies position the coast as a desirable commodity where ownership of sea-frontage property equates to economic wealth and gain (Colenbrander et al., 2012). The use of coastal development as a conduit for wealth creation in developing country contexts - towards modernity - certainly opens up potential to compound risks already presented by climate change and sea-level rise.

Beck (1992) suggests that risks produced by the process of modernization or by modernized societies are no longer bound to their origin, but are becoming increasingly distributed over broader temporal and spatial scales and are beginning to become increasingly difficult to perceive. The notion that risks are tending towards a 'latency' shares similarities with Leichenko and O'Brien (2002) and Cartwright's (2009) earlier descriptions of climate risks manifesting in a variety of forms over time and space and provides a particularly relevant departure point in understanding the complexities and 'wickedness' in the governance of risk. Reference has been made to the increasing temporal and spatial manifestation of risks. Beck suggests that this expansion is taking place to such an extent that it is now evident at a global scale. Climate change provides a salient example of risks manifesting at an all-encompassing spatial scale. The decadal timescales in which sea-levels are locked into rising trajectories signifies the temporal magnitude at which risk is being transferred into the future.

Climate change is an example of the boundless hazards that may be produced as a consequence of wealth production in pursuit of modernity. The calculability and prediction of climate risks due to the latent intangibility that is spread across borders and 'detached' from their origins becomes problematic in that the dispersion and latent nature of this risk is conducive to, and creates, an accountability void. Within global climate change debates, the topic of risk inheritance often arises: the impacts of climate change in the 'global south' and the motivation for compensation from the modernized north as the 'source problem' highlights the distributive nature of risk in contemporary society (Gupta, 2014). The distributive nature of risk has led to rigorous debate over responsibility, the task of which is made difficult given the untraceable nature of modern risks (Beck, 1992). Compounding the accountability void is complicity that is synonymous with a lack of responsibility. As Beck (1992) states, everything and everyone becomes cause and effect, and thus non-cause.

The anticipation of risk implies that risk has a future element to it. Future risk in the 'now' is intangible and surreal; it is a 'projected variable'. Colenbrander et al. (2012) suggest that the latent and 'imperceptible' nature of risks generated by certain interventions results in their continued application. Such risk only becomes apparent into the future and appears to be disconnected both spatially and temporarily from the original cause of the risk. The construction of port breakwaters in Cape Town, for example, have

been shown to alter wave climate which may lead to increased rates of beach regression further 'downstream' of the port (CSIR, 1996). Thus, while the port may be protected from storm surges, the risk is transferred over space to a seemingly detached and distant location and which may only begin to manifest many years after breakwater construction.

Conversely, wealth production, or similarly poverty alleviation, in the 'now' is clear and tangible. Mobilizing proactive responses in preparation for future intangible risks in developing country contexts, as a consequence, is more easily overruled by priorities of tangible wealth creation in the present (Beck, 1992). This is of particular relevance in formulating adaptation responses in anticipation of future sea-level rise: adaptation interventions may be conceived as obstructive to urgent developmental priorities (see Chapter Five for a deeper analysis of this). Beck suggests that we are no longer dealing with the threats and hazards arising out of 'nature' but rather with risks arising out of development itself. The web of risk production in modernized societies is becoming increasingly elaborate to the point where social systems – which include bureaucratic forms of organization - are in themselves becoming implicated in the production of risks. This notion is returned to in more detail in Chapter Three.

In considering the problematic of a Risk Society, Beck (1992) contemplates how risk and hazards, as generated by modernized or modernizing societies, may be limited. Further, when risks surface as latent side effects, he queries how these risks may be distributed in a way that it does not impede the modernization process nor exceed sustainability limits. To achieve reform in a Risk Society, Beck proposes that modernization must become reflexive. Reflexive modernization has its origins in the sociology and critique of knowledge produced by science. Rather than using science to expand and 'grow' the resource base in pursuit of maximizing and streamlining production goals, science instead must be used to re-evaluate the relationship between society and resources, where progress is measured and achieved through subsequent reforms and adaptations. Discourses in sustainable development – which includes the sub-category of ICM - are considered as 'off-shoot' expressions of reflexive modernization (Beck, 1992)

The most widely used definition of sustainable development is that defined by the World Commission on Environment and Development (WCED) in 1987 (Mebratu, 1998; Kates et al., 2005). In WCED's report entitled *Our Common*

Future, sustainable development is defined as meeting ‘...the needs of the present without compromising the ability of future generations to meet their own needs’ (WCED 1987, p.43). This definition arose out of the growing realization that natural resources were not infinite, and that the trajectory of resource consumption is a threat to the earth’s life support systems (Hopwood et al., 2005; Redclift, 2005). *Our Common Future* constituted a major turning point whereby debates surrounding sustainable development have since become the focus within the environmental discourse (Mebratu, 1998; Kates et al., 2005). The global embrace of the concept was largely attributed to positive connotations of the key words ‘sustainable’ and ‘development’. The combination of these words instills the concept as a collectively shared and worthwhile value to pursue: moving towards a modernized state through reducing poverty, improving the environment and ensuring social equity (Mebratu, 1998). In a world dominated by diverse and conflicting interests, these are powerful and appealing values (Kates et al., 2005). Critically, this definition received support within the political arena due to its people-centric, as opposed to eco-centric, resonance (Pearce et al., 1989).

The worldwide adoption of sustainable development as the panacea to solving the world’s environmental and social crises unsurprisingly led to discussions regarding how to operationalize it and achieve it in practice. Although sustainable development offers an alluring and holistic ‘solution’ to the world’s crises, there is much literature that argues the concept of sustainable development at best presents a vague idealism. It has failed to produce overarching policies and change of behavior at the individual or societal scale and offers no resolution to the conflicts that arise out of the divergent interests in the pursuit of the concept’s core values (Campbell, 1996; Hopwood et al., 2005; Redclift, 2005). Rigorous debates arise from the tradeoffs between protecting a green city and promoting an economically growing city where such growth is equitable (Campbell, 1996; Mebratu, 1998). By the mid 1990’s, the vagueness of the concept was no longer a basis for consensus, but rather a source of contestation and disenchantment (Daly, 1996; Giddings et al., 2002), with some labeling sustainable development as an oxymoron: fundamentally contradictory and irreconcilable (Kates et al., 2005; Redclift, 2005). Contributing to the difficulties of ‘pinning down’ a consensus of sustainable development is that conceptions of sustainability are culturally framed in various and, at times, contested ways which is reflective of the heterogeneity of stakeholders in the sustainability debate (Meadowcraft, 2007). However, while debates continue, the global

community has rallied around this concept and adopted Agenda 2030 with its 17 Sustainable Development Goals in 2015. Within this document, core themes of inclusivity and social justice remain (Gupta & Vegelin, 2016).

Theorizing inclusive and sustainable development is particularly useful in discussions on risk governance in coastal regions given the converging pressures and the notion that coastal cities are at the forefront of the coastal sustainability challenge (Glavovic, 2015). Trading off sustainability imperatives in search of an optimal and collectively accepted target is considered a 'chimera' in coastal contexts where coastal systems are in themselves '...open, coupled, complex, unpredictable and characterized by ecological limits, interactive non-linear system dynamics and emergent properties' (Glavovic 2013a, p.947). While the concept of sustainable development may have its detractors and its pursuit considered a 'wicked' task, it remains unquestionable that the concept evokes a focus on conflicting environmental, social and economic interests, the resolution of which becomes a societal function channeled through the process of governance.

1.5.3 Governance, government and bureaucracy

The mitigation of risks and the resolution of conflicting and competing interests within the sustainability debate requires some form of societal organization that enables collective decision making in moving towards an equitable and sustainable world. Questions as to what form this guidance may take, the roles of actors, institutions and rules as well as power differentials between various actors in shaping decision making falls within the domain of rapidly expanding and evolving theories on governance. While governance has historically been associated with government, governance is being increasingly shaped and influenced by interactions with a broader spectrum of actors beyond government. The transition from government to governance coincided with theoretical developments on legal pluralism that took hold in the 1980's (Kjaer, 2004 cited in Scholtens, 2016). This transition was promoted on the one hand by those who wanted to deepen democracy and stakeholder participation in governance processes. On the other hand, this shift was favoured by those who called for the dilution of governance responsibilities held by government in line with the neo-liberal agenda, holding the view that '...closed, formalistic, narrow-minded, conservative, rigid, uncoordinated, and exclusive' modes of governance led by government were no longer appropriate (Torfing, 2012, p. 9). Under the neo-liberal agenda the private sector and market-driven economies are considered to be key actors and drivers for shaping and determining governance

outcomes. The period of enquiry in the 1980's on the subject of governance has since led to a range of new theoretical contributions, such as those by Ostrom on 'polycentric governance' (context sensitive) and 'governing the commons', 'interactive governance' originated by Kooiman, 'nodal governance' by Drahos et al. (2005), adaptive governance, and normative approaches such as 'good governance' as led by the World Bank (Scholtens, 2016).

The expanding plurality of governance is, of course, increasingly subject to a multiplicity of influences from a variety of actors and institutions and their increasingly complex network of structures and processes (Lebel et al., 2006). The transition from government to governance held by a wider set of actors draws the process of governance into arenas of discursive debates that focus on problem identification and the formulation of normative governance goals towards the resolution of societal problems (Hajer, 1995). The ability of citizens and non-governmental actors to engage in these arenas and contribute to more formalized processes of policy development is also reflective of a shift towards participatory democracy (Joshi & Houtzager, 2012). The re-configuration of the governance landscape to a broader set of actors is also exposing government to a wider set of resources such as financial, intellectual, technological, and operational capabilities that were not previously utilized by government (Glavovic, 2013a).

Interactive Governance (IG) presents a useful theoretical framework from which to unpack and understand the emerging complexities surrounding the governance of coastal systems. It considers the notion that governance is becoming increasingly characterized by the involvement of multiple socio-political actors across the private and public sector divide and that governance itself becomes a function of the interactions between government, the markets and civil society (Kooiman, 2003; Kooiman et al., 2005). In this shift towards a governance plurality, Torfing (2012, p.14) reflects on IG as a '...complex process through which a plurality of social and political actors with diverging interests interact in order to formulate, promote, and achieve common objectives by means of mobilizing, exchanging, and deploying a range of ideas, rules and resources'. Kooiman (2008 cited in Scholtens, 2016) describes IG as having both normative and analytical dimensions to it. Normative in a sense that 'interacting' – typical of participatory democracy – is better than doing things in isolation or in a dictatorial manner. Analytical in a sense that IG proposes contemporary challenges are governed by a multiplicity of actors beyond government, rather than government alone.

Interactive Governance uses the term 'governability' to describe the '... overall capacity for governance, which is assessed by determining the properties, qualities and functionality that make it more or less governable' (Chuenpagdee et al., 2008, p.1). Governability also refers less to a state and more to a variable process - it is not a capacity that is given once and for all and that remains in a stable state. Rather, governability changes in response to internal as well as external conditions. Fisheries, for example, are often regarded as complex adaptive systems in which unpredictability is a key factor (Mahon et al., 2008). External factors are also beyond the control of governors. A Marine Protected Area (MPA) may be well governed, but may still lack in governability due to influences from exogenous disturbances (Jentoft et al., 2007, 2013). Governability '...thus comes not only with limitations but also with vacillating potentialities. It is therefore argued that the act of governing necessitates flexibility and learning, and must account for the possibility of disappointment and failure' (Kooiman & Bavinck, 2013, p.13). The multiplicity of competing and overlapping legislative frameworks and divergent actor interests that characterize coastal zones (Cicin-Sain, 1998; Glavovic, 2006; Kremer & Pinckney, 2012), together with coastal zones feeling the brunt of climate change impacts, places such areas as particularly difficult spaces to govern, and which typically reflect low levels of governability (Chuenpagdee et al., 2008).

Interactive Governance also describes governance more systematically. It frames the totality of governance according to three main components, namely the governing system (GS), the system-to-be-governed (SG) and governance interactions (GI) that mediate between the SG and GS (Kooiman, 2003) (Figure 1.1.). The GS in turn comprises elements, modes and orders. Elements consist of images, instruments and actions. These three resources provide governance actors with a structured way of governing the SG. Images provide the governing ideas, instruments are used to achieve these images, and actions are used to put the instruments to work to achieve these images (Kooiman et al., 2005). Images are developed to unilaterally give direction to the choice of a particular instrument, whereby instruments provide the basis for effective actions by governance actors to achieve those images, provided that those images are accurate and legitimate and are reflective of a consensus. The compatibility between elements is considered central to effective governance. Conversely, when images, instruments and actions are not well defined and formulated, governability is expected to be low (Chuenpagdee, 2008). The importance of compatibility extends beyond governance elements. Kooiman

and Bavinck (2013) suggest it is just as important for the GS to be compatible with the SG, here the term ‘match’ or ‘mismatch’ is used to describe whether a GS system displays reciprocal or ‘isomorphic’ characteristics to the SG or not. For a GS to ‘match’ and be responsive to a SG that is characterized by complexity and dynamism, so too should the GS demonstrate reciprocal characteristics. A mismatch between the GS and the SG is likely to result in poor governance outcomes (Jentoft, 2007a; Kooiman & Bavinck, 2013). For example, a rigid and inflexible GS will not be sensitive to changes in the SG, risking the continuation of inappropriate management prescriptions (see Chapter Three).

Governance modes, described as the nature of the governance response to address a particular societal challenge, are typically classified into three categories, namely hierarchical, self and co-governance. Generally speaking Interactive Governance advocates that as governance is increasingly characterized by a plurality of actors and interests, it stands that a co-governing mode between the state and civil society is the most appropriate mode of governance. The idea is that promoting meaningful dialogue with a wide spectrum of governance actors through deliberative processes creates an expanded and shared awareness between different actors and their values, worldviews and epistemologies. In other words, understanding the realities of others is improved (Chippendale et al., in press). Baud et al. (2011) and Martinez (2009) suggest that, in understanding the way in which various actors perceive and experience issues, a more holistic understanding of societal challenges is generated, which is useful in mobilizing and developing democratic (and procedurally fair) processes and ultimately the determination of appropriate and effective responses to these challenges. Co-governance approaches are considered especially valuable in the risk governance domain, where risk perceptions, needs and priorities, may differ between government and those members of public that are affected (Cannon & Müller-Mahn, 2010). It follows that governance interventions to address coastal vulnerability, should only take place if the process in which these interventions were formulated, are inclusive and procedurally fair (thereby legitimate) and that the outcomes are considered socially just (Oelofse et al., 2006; Benson & Jordan, 2013; Song et al., 2013).

Co-governance does not however represent a silver bullet for solving societal challenges, but may in itself generate its own unique challenges. A diversity of governance actors presents a formidable challenge for ensuring that co-

governance modes are representative and successful (Healy, 1996; Ockwell, 2001; Hajer, 2003). This is particularly relevant in countries such as South Africa that are culturally diverse, with stark differences in education, economic standing, culture and language (Healy, 1996). Processes designed to promote inclusivity and deliberative engagement run the risk of having a 'co-opting effect', where such processes may lead to concession, but are not followed through by any meaningful action or change (Hajer, 2003).

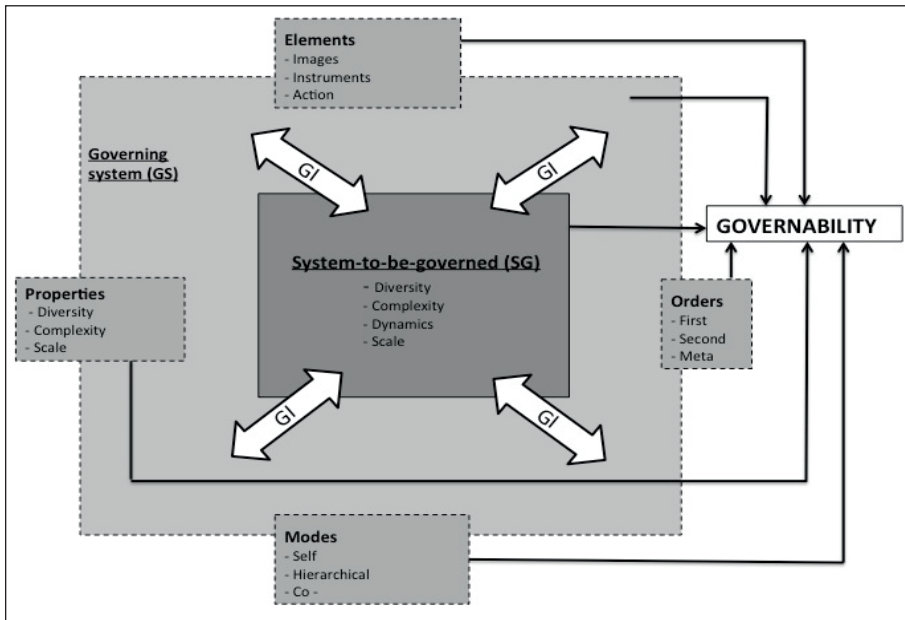
The decentralization of decision making and the emphasis on inclusivity as bastions of co-governance may also lead to difficulties in administrative order, efficiency, rights and equity (Chuenpagdee & Jentoft, 2013). The plurality that characterizes governance in contemporary democratic societies also positions government on a 'level playing field' as one of many legitimate actors in the governance arena. Indeed, traditional channels of accountability as a linear relationship between the government and civil society no longer holds true in the emergence of increasingly pluralized forms of governance (Scott, 2000). It is at this point that a tension arises between co-governance, its emphasis on promoting inclusivity, and the need to ensure accountability. While the inclusion of a wider spectrum of governance actors in deliberative processes of decision making may tick the inclusivity box, it may simultaneously lead to an accountability deficit: the more actors are involved in governance decision making the more difficult it becomes to determine accountability (Scott, 2000). The loss of accountability through an expanding governance plurality resonates with Rittel and Webber's (1997) supposition in respect of determining governance goals: a plurality of interests and objectives held by a plurality of actors makes it difficult to determine goals.

Enquiries on accountability are particularly relevant within the domain of coastal governance where risk may arise as a consequence of governance actions and where such risk may materialize in both time and space in a variety of forms across socio-political, economic and environmental spectrums (see sections 1.2 and 1.5.2, Chapter One and sections 7.1 and 7.2.1, Chapter Seven for an elaboration on this). The interplay and 'symbiosis' that may exist between a governance plurality enabled through co-governance and accountability is useful towards understanding why coastal zones demonstrate low levels of governability. The tension that exists between co-governance and accountability, and how this may be addressed within the coastal risk and vulnerability domain at the local scale, is discussed in Chapter Seven.

The third and final component of the GS – orders - relate to those governance activities that take place within the GS. These are classified as meta-governance, second and first orders of governance. Meta-governance relate to those normative governance principles – such as those principles that define a democracy – which form the overarching ‘doctrines’ and goals to which a GS may subscribe. Second order governance refers to those institutional or organizational structures and rules that are set in place from which to provide an enabling environment to achieve first order governance outcomes. Second order governance structures, such as those instilled by bureaucracies, are designed to provide structure from which to achieve desired governance outcomes. Bureaucracy as a second order governance structure and its relationship with first order governance outcomes is discussed in further detail later in this section. First order governance outcomes include, for example, the provision of basic services. First order governance interactions take place on a day-to-day basis whenever and wherever people and their organizations interact to solve societal problems and create opportunities. These problems are not considered an ‘objective’ reality but instead may be seen as constructs in the minds of social actors (Chuenpagdee, 2008). The notion that problems may be ‘socially constructed’ is of particular use and relevance to the subject of this research and is explored in further detail in Chapter Five.

Interactive Governance provides a platform from which to cognize the interplay between governance components and the bearing this has on broader governance successes or failures. A specific area of relevance to this research is the relationship between second order governance structures and how these may influence the action potential of actors to achieve first order governance goals. The actions of these actors, which may consist of any social unit possessing agency or power, may either be constrained or enabled by the frameworks within which they function (Kooiman & Jentoft, 2009). These frameworks, or structures, may consist of any number of dimensions, ranging from culture, law, rules, agreements, procedures or technical limitations (Kooiman & Jentoft, 2009). Bureaucracies embody, and systemically uphold, a number of these structural traits. Bureaucracies are synonymous not only with government but large-scale organizations throughout the globe (Weber, 1946; Giddens, 2001). Given the universal hegemony with which such forms of organization are utilized within modernized, or modernizing states, and forming the structural foundation from which governance proceeds, the interplay between the two and how this may influence governance more generally is an important field of enquiry (Olsen, 2006).

Figure 1.1: Conceptual framework of Interactive Governance



(Source: Kooiman, 2003)

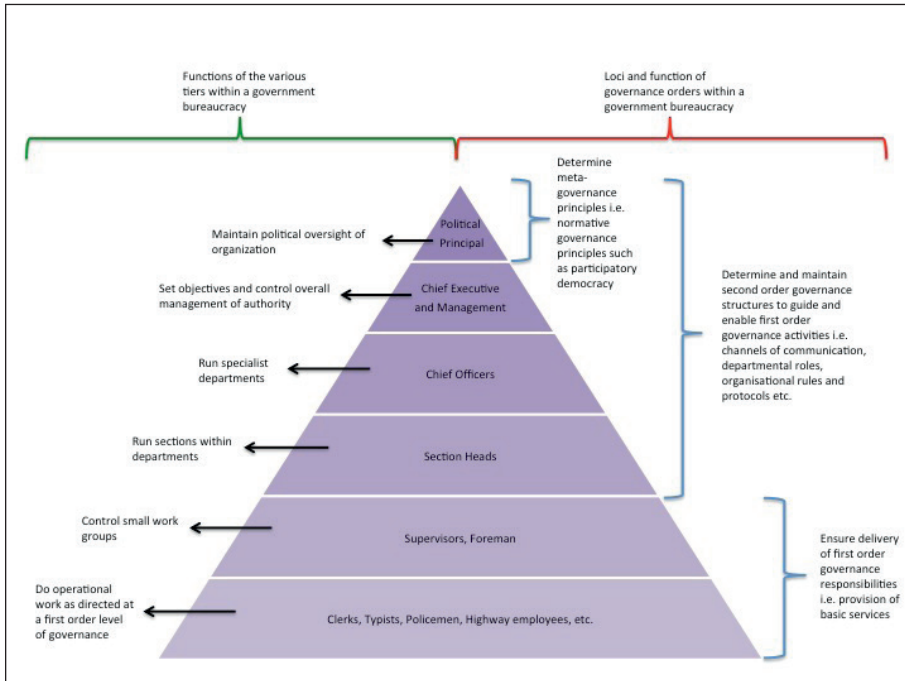
Max Weber, the pioneer of bureaucracy theory, considered bureaucratic forms of organization as a product of the broader rationalization of society, both a process and a form that has influenced all facets of life, from science to education to government (Weber, 1946). Noting the parallel with the transition from a pre-modern to a modern state, Weber suggests that instead of relying on traditional beliefs, people in the modern age are increasingly occupied with making rational decisions towards a clear goal. The expansion of bureaucratic forms of organization within modern societies was considered inevitable given that such a form of organization is the only, and most efficient, way of coping with the administrative requirement of social systems (Giddens, 2001). Here Weber (1946) defines the purpose of an organization as the coordination of human activities, and the goods and services they provide, in a stable fashion across time and space.

De Gournay first coined the term 'bureaucracy' in 1745. Meaning both an office and a writing table, it is derived from the Greek verb 'to rule'. Thus the term bureaucracy comes to mean the rule of officials (Giddens, 2001).

Weber's theory on bureaucracy contained two fundamentally differing types. The first concerns itself with bureaucracy as being a legal rational authority functioning within a pluralistic power structure. The second conception considers bureaucracy as a totalitarian form of organization that has resulted from the institutionalization of charisma in a bureaucratic direction (Constas, 1958). With the latter, bureaucracy tends to replicate as a monopoly of power; witness the Soviet Union and the concentration of power within a bureaucratic ruling class. Power has been formed through the 'routineization' of charisma – through the Bolshevik movement – towards a bureaucracy (Constas, 1958). Weber made the assumption that in the long term, charismatic bureaucracy would gradually evolve towards the legal rational type of bureaucracy. While Weber distinguished two forms of bureaucracy, he did not categorize different *types* of bureaucracy. Instead he constructed an ideal form of bureaucracy, a Weberian bureaucracy, that has attracted very little critique and which has formed the basis of enquiry into bureaucratic forms of organization since. The following characteristics constitute a Weberian bureaucracy (Weber, 1946, p.196) (Figure 1.2):

- 1) 'There is the principle of fixed and official jurisdictional areas, which are generally ordered by rules, that is by laws or administrative regulations;
- 2) The principles of hierarchical office authority and of levels of graded authority mean a firmly ordered system of super and subordination in which there is a supervision of the lower offices by the higher ones;
- 3) The management of the modern office is based upon written documents ('the files'), which are preserved in their original or draught form. There is, therefore, a staff of subaltern officials actively engaged in a 'public' office, along with the respective apparatus of material implements and the files, make up a 'bureau'. In private enterprise, the 'bureau' is often called 'the office';
- 4) Office management, at least all specialized office management – and such management is distinctly modern – usually presupposes thorough and expert training. This increasingly holds for the modern executive and employee of private enterprises, in the same manner that it holds for the state official;
- 5) When the office is fully developed, official activity demands the full working capacity of the official, irrespective of the fact that his obligatory time in the bureau may be firmly delimited, and
- 6) The management of the office follows general rules, which are more or less stable, more or less exhaustive, and which can be learned'.

Figure 1.2: Weberian bureaucracy in relation to governance orders as per the Interactive Governance framework



(Adapted from Giddens, 2001; Kooiman, 2003)

The advance of bureaucracy over other methods of administration – such as collegiate, honorific, avocational - according to Weber, is attributed to its ‘...technical superiority over any other form of organization’ (Weber, 1946, p.214). Weber creates the analogy whereby the success and efficiency of a bureaucracy is likened to the use of a machine for production, as opposed to non-mechanical modes of production. Further he suggests that ‘Precision, speed, unambiguity, knowledge of the files, continuity, discretion, unity, strict subordination, reduction of friction and of material and personal costs – these are raised to the optimum point in the strictly bureaucratic administration, especially in its monocratic form’. Certainly the ‘precision’ that bureaucracies deliver continues to present a wide range of benefits in contemporary society. Rigid or ‘mechanised’ approaches to organizational procedures is of great value to aid agencies in the prevention of the mal-administration of public funds as well as being effective in reducing administrative costs

(Eisner, 1998; Fukuyama, 2013). Gore (1995) recounts on the high levels of customer satisfaction in dealing with the U.S. Social Security Administration as a direct result of an efficient bureaucracy. Rainey and Steinbauer (1999) attribute success of logistical support to the U.S. Department of Defense as a result of efficiency due to bureaucratic organization. The success of bureaucratic forms of organization has led some scribes to advocate that the bureaucratization of society is on the rapid increase. Ritzer (1998) explores this hypothesis through his 'McDonaldization' theory where he argues that burgeoning industries such as the McDonalds chain are dominating more and more sectors of society. The success of the McDonalds chain, ascribed to efficiency, calculability, uniformity and control through automation and mechanization is reflective of a society becoming more and more rationalized – and therefore bureaucratized - with time.

Despite the argument that society is becoming increasingly bureaucratized and rationalized, there is a raft of literature on the discontents and pitfalls surrounding bureaucracies and subsequent calls for 'de-bureaucratization' (Hanlan, 1967; Caiden, 1985; Lipsky, 2010). The first primary deficit relates to a lack of autonomy at lower levels within bureaucracies. Autonomy may be considered as the degree to which the political principle defines and issues mandates to bureaucrats as the agent of the political principle. If an appropriate degree of autonomy is a key requisite for enabling good governance, then it is questionable to apply Weberian bureaucracy as an appropriate framework from which to understand how bureaucracies *should* work. Fukuyama (2013) makes the case that such a framework is open to scrutiny as it assumes 'street' level bureaucrats are simply tools of the political principal. Yet examples of efficient and productive bureaucracies reveal a reverse flow from the low level bureaucrat to the political principal (Giddens, 2001; Fukuyama, 2013). The importance of autonomy is that it may be used as a means to evaluate the quality of governance. No bureaucracy should define its own mandates, whether the regime is democratic or authoritarian (Fukuyama, 2013). An autonomous bureaucracy determines its own goals independently of the political principal whereas rules and goals within a non-autonomous bureaucracy are exclusively set by the political regime (Fukuyama 2013). The extremities of bureaucratic autonomy result in poor governance. On the one extreme, that of complete autonomy, street level bureaucrats may escape political control through defining their own procedures and goals. On the other extreme, bureaucrats become completely bound by rules and regulations determined by the political principle and runs the risk of becoming an autocracy (Fukuyama, 2013).

Other deficits relate to the focus of bureaucracies on specialization – by extension compartmentalization – and the difficulties bureaucracies have in coping with dynamism and uncertainty - the reciprocal response requiring adaptability and innovation. Myers and Kent (2008, p.31) argue ‘we can no longer afford to split the world into sectorial and departmental components. Our environments, both ecological and economic, with their complex webs of interactions operating in a continuum, reveal that everything is connected to everything else’. Myers and Kent (2008, p.31) continue: ‘Yet we become pre-occupied with a single portion – the sector, zone, department, discipline etc. – that we lose sight of the larger perspective’. This is of particular relevance to those bureaucracies that are tasked with the responsibility of governing coastal areas or resources as indivisible and mobile systems that transcend jurisdictional boundaries.

1.5.4 Adaptive governance and Integrated Coastal Management

Adaptive governance, as a particular form of Interactive Governance, is widely recognized in literature. It places emphasis on responding to complexity, uncertainty and change with the intent to protect the livelihoods of people through the minimization of risk and vulnerability (Berkes & Folke, 1998; Adger et al., 2013; IPCC, 2014b; Wise et al., 2014; Woodward et al., 2014). Gaining prominence from the 1970s, adaptive governance encourages iterative policy monitoring and review towards enabling governance that is more responsive to the SG (Williams, 2011; Bruch, 2009). It considers the cross-scalar linkages inherent not only to earth system dynamics (Folke et al., 2005, 2007; Gunderson & Holling, 2002; Olsson et al., 2006) but also those that characterize the multiplicity of actors and institutes comprising the social landscape (Dietz et al., 2003; Lebel et al., 2006). Its framing of the governance landscape as a plurality of actors correspondingly assumes that while governance actors are mainly rational in their actions, knowledge held by the various governance actors is by and large imperfect, incomplete and unevenly distributed.

These central attributes of adaptive governance have resulted in its global acclaim as the most appropriate governance paradigm from which to respond to the challenges posed by a warming climate (Peterson et al., 1997; Adger, 2001; Engle & Lemos, 2010; IPCC, 2014b). Climate change presents challenges that are predominantly characterized by uncertainty and risk – systemic in nature and unequally distributed - complexity, contested science surrounding climate change and the fact that poor governance can

compound impacts from climate change (Bakker, 2007; Pahl-Wostl et al., 2013a; IPCC, 2014b; Hurlbert, 2016). Through framing the governance landscape as a network of institutes and actors, adaptive governance applies a more systemic approach (as opposed to hierarchical modes lodged within bureaucracies and associated sectoral approaches) in its attempts at resolving risk and uncertainty (Berkes & Folke, 1998). Recognising that climate change is not a precise science and that there will be the inevitable contestations arising from such uncertainty, adaptive governance advocates that such uncertainties are mediated and resolved through trans-disciplinary and participatory approaches (Hisschemöller & Gupta, 1999; Bruch, 2009; Pahl-Wostl et al., 2013b). Socio-institutional learning is prompted through questioning assumptions, evaluating and amending governance outcomes and actions respectively (Holling, 1978; Lee & Lawrence, 1986; Bormann et al., 1999). It is this feature where institutes 'co-evolve' with the systems they are governing through 'learning by doing' that resonates with the notion of governance compatibility and the importance of 'matching' the GS with the SG advocated within the IG framework.

The disparate exposure to risk as a function of inequality and a lack of access to resources, particularly relevant to the global south, are addressed through institutional reforms aimed at promoting inclusive development (Mollenkamp & Kastens, 2009; Gupta et al., 2010; Gunderson & Holling, 2002; Olsson et al., 2006). Here inclusive development is founded on three central pillars: that social systems are dependent on a natural resource base and the respective ecosystems services provided by such resources; that access to resources are inequitable with the marginalized suffering the greatest inequality in access to these resources and subsequent exposure to risks; and that inclusivity can only be achieved through countering uneven power distribution through relational and participatory approaches (Gupta et al., 2015).

The value of adaptive governance extends beyond its efficacy in responding to those challenges presented by changing climate. From a natural resource governance perspective, and in appreciation of 'uncertainty' and 'imprecise science' as unavoidable factors in decision making, its usefulness lies in recognizing that what we know about ecosystems in one decade may not necessarily hold true for the next. By extension, static and unresponsive forms of governance are likely to fail (Walters, 1986; Hilborn & Ludwig, 1993; Holling & Meffe, 1996; Berkes et al., 2000; Olsson et al., 2004; Galat & Berkley, 2014). Institutional learning however does not take place without the careful

consideration and construction of mechanisms to facilitate self-adjustment in order to become mutually responsive to the dynamism inherent to natural resource systems (Stankey et al., 2003; Fleischman, 2008; Williams, 2011). This requires the application of design experiments to test management hypotheses and, based on the outcomes of these tests, alter management prescriptions.

A case study of the United States Forestry Service, one of the largest natural resource management bureaucracies in the world, provides an example of the consequence of applying rigid and non-responsive modes of management to a dynamic and unpredictable natural resource system. The initial success of the Forestry Service was attributed to efficient field management of forest resources; clear reporting lines and rigid hierarchical management structures (Kaufman, 1960). Forests are however not static systems but ones that are constantly evolving and changing through successional growth over time. This led to the realization that management prescriptions were becoming out-dated, irrelevant and in some ways detrimental to the resource base being managed. Stankey et al. (2003) determined that the Forestry Service, through rigid organizational structures, was unable to adapt to, and co-evolve with, the resource base it was attempting to manage. The failure of the Forestry Service to adapt to a changing resource base was brought into sharp focus in the early 1990's with deteriorating forest habitat (based on out-dated management prescriptions) and the consequent demise of the Northern Spotted Owl, an indicator species of healthy old growth forests (Yaffee, 1994). Conversations with foresters in the employ of the Forestry Service revealed that although they in themselves recognized the need for change in management regimes and prescriptions, they felt restricted in their attempts to apply more innovative and responsive approaches due to systemic rigidity created by legal mandates and organizational-level cultures that favoured precaution and certainty (Yaffee, 1994). The inability to be experimental and explore alternative management approaches more sensitively and responsively to the dynamism of the resource base was further limited by external litigious agencies. Indicative of the changing landscape towards a governance plurality, these 'external' actors played a central role in shaping and defining management prescriptions as they too were also opposed to any experimentation or deviation from the already well-established and 'reliable' management procedures. The salient finding from research into the Forestry Service was that '...regulatory agencies preferred the familiar action with uncertain consequences to the unfamiliar action with uncertain consequences but with the possibility of learning' (Fleischman, 2008, p.12).

The importance of adaptive governance and management in a changing world is self-evident. Certainly the physiognomies of the transitional space between land and sea masses as a dynamic and unpredictable system and the escalating pressures associated with climate change in this space has necessitated that principles of flexibility and adaptability become central tenets to the ICM paradigm. The utility and usefulness of ICM as an extension of the broader adaptive governance paradigm in coastal settings has resulted in its uptake globally (Taljaard et al., 2012). The pursuit of sustainable coastal development through the competency of ICM resonates with Beck's notion of reflexive modernization. As with reflexive modernization that attempts to re-evaluate the relationship between society and resources and the subsequent required change in behaviour by society, this 'feedback' loop is similarly evident in ICM. The process of learning – iterative and on-going re-evaluation of system responses to management prescriptions and behavioural change - is described as the ICM cycle (Olsen, 2003). The ICM cycle consists of five phases, which are repeated every time the fifth phase is completed (see Figure 3.1, Chapter Three). The first phase consists of the identification of governance challenges through research and monitoring. Once these issues have been identified, the second phase follows whereby a course of action is formulated to address these challenges. This course of action, the third phase, is the most 'politically charged' phase within the ICM cycle as it requires commitments to enable behavioural change as well as the allocation of resources to implement the necessary actions (Olsen et al., 2006). The fourth phase consists of the implementation of the programme of action, which is then followed by the fifth phase of evaluation in terms of success and failure of these implementations, thus completing a management cycle 'generation'. Each cycle, as it gains strength and knowledge, expands towards addressing issues that were either not identified in the previous generation, new challenges that have surfaced, or those that were not considered a priority at the time of the previous cycle (Olsen et al., 2006).

The value of ICM centres around its ability to encourage actors within a governance landscape characterized by institutional pluracy to act in a manner that is more integrated and unified, offering coherent policy stances and management prescriptions as it relates to the governance of the coastal space (Clark, 1996; Van den Bergh & Nijkamp, 1997; French, 2004; Rajabifard et al., 2005; Williamson et al., 2005; DEAT, 2006). Indeed here ICM strives to '...join up' the different policies that are relevant to the coast as well as bringing together stakeholders from local to national levels to inform,

support, and implement these policies' (Atkins, 2004, p. 1). Within the IG framework, ICM may be described as a governance instrument from which to promote greater compatibility of 'goodness-of-fit' between the GS and the SG in coastal contexts.

The shift away from sectoral approaches, both at a regional and trans-national scale that dominated coastal management efforts in the 1970's, has positioned ICM as an important governance instrument in the pursuit of the broader objective of sustainable development (Olsen, 2003; Christie et al., 2005). Even prior to the formulation of the term 'ICM' and the emphasis on institutional collaboration in the governance of coastal resources, coastal management was in itself recognized as a distinct and necessary competency in coastal settings. Earlier events that signalled government's intent to pay specific attention to the management of coastal resources include the promulgation of a number of legislative bills worldwide, such as South Africa's Sea Shore Act of 1935 and The United States Coastal Zone Management Act of 1972. It was not however until the mid-to late 1980's when modes of coastal management reflected a shift to a more collaborative and systems orientated approach that integrative forms of coastal management started to gain momentum on the global stage. Integrated Coastal Management was included as a principal recommendation in Chapter Seventeen of Agenda 21, an outcome of the Earth Summit at the UN Conference on Environment and Development in 1992, Rio de Janeiro (SAIIA, 2015). It was elevated to, and merged within, the proliferating discourse of sustainable development through Agenda 21 in recognition that coastal areas, if governed correctly, could be leveraged to achieve equitable economic and social benefits (Cicin-Sain et al., 2011). The identification of ICM as a paradigm from which to promote sustainable coastal development led to a proliferation in the number of countries formally adopting and implementing ICM strategies. Indeed, the number of countries engaged in ICM initiatives increased from approximately 59 in 1995 to 100 in 2000 (SAIIA, 2015). A marked increase was also noted in the development of integrated national ocean policies that extended to broader spatial scales of Exclusive Economic Zones. The development of ICM initiatives was further accelerated at Rio+20 Summit, which made strong motivations for ICM efforts to be scaled up through financial and capacity investment at regional and national levels (Portman et al., 2012; SAIIA, 2015).

Despite the growth of the ICM paradigm, the deteriorating state of coastal zones the world over and increasingly vulnerable coastal populations is testament to the challenges and weaknesses that exist not only with ICM but more broadly in the governance of coastal regions. These may be attributed to a lack of political will for financing ICM initiatives, particularly in developing nations, and subsequent capacity constraints within both government and the private sector (SAIA, 2015). This filters further down to the inability to fulfill basic responsibilities and functions, such as enforcement of regulatory and planning mechanisms designed to conserve coastal resources and to mitigate against coastal risks (Portman et al., 2012).

Like governance studies, ICM is not an exact science: uncertainties on how to proceed within complex socio-institutional and environmental settings, when tasked with the resolution of wicked problems, are a potent and destabilizing combination. Although ICM attempts to coordinate and steer multiple institutional interests and mandates in adaptive and unified ways to match the dynamism of the coastal space, competing and overlapping competencies and a lack of a cohesive decision making frameworks still persist (Celliers et al., 2015). As alluded to previously, there remains limited literature on how to institutionalize ICM at the sub-regional/local scale and level. Research within the European Union (EU) reveals the difficulties in transnational cooperation, attributed to language barriers and the sheer scale and number of institutional role players all linked to the governance of the coast (European Commission, DG Environment 2011). Similarly, McKenna et al. (2008) elucidate on the potential for conflict and contradictions when institutionalizing ICM in the EU. Here the challenges arise not from more resolvable 'externalities' such as a shortage of capacity or funding, but the internal 'architecture' of ICM itself. The EU Commission Demonstration Program on ICM identified the following principles that were considered necessary to 'ensure good coastal zone management, taking into account the good practices identified, *inter alia*, in the Commission's demonstration program on integrated coastal zone management' (McKenna et al., 2008, p.941):

- The importance of applying a holistic perspective in considering the interdependence and disparity between natural and social systems in the coastal environment;
- Applying long-term perspectives in which the precautionary principle and the needs of future generations are taken into account;

- Adaptive management based on sound scientific principles to facilitate adjustment of the governing system as problems and knowledge gaps arise;
- Consideration of local contexts and diversity of coastal zones in Europe as a prerequisite for responding to practical and dynamic challenges;
- Work with natural processes (as opposed to against) and not to exceed the carrying capacity of coastal ecosystems;
- Be inclusive of all Interested and Affected Parties (I&APs) in the formulation of management prescriptions;
- Facilitate cross-scalar interactions and engagement between institutions representative of national, regional and local for consistent policy formulation, and
- Apply a combination of instruments to facilitate coherence between sectoral policies and planning interventions.

These principles were split into two ‘stand-alone’ groups, one focusing on strategic higher level goals and the other on the local level. However, the lack of prioritization and the failure to recognize that key ICM principles should be presented as an indivisible and integrated set has led to difficulties in the uptake of ICM in practice. Instead, these oversights may lead to irreconcilable differences in strategy thus undermining the very intent of ICM within the EU (McKenna et al., 2008). The salient point here is not so much that there may be negative repercussions, but rather that there remains failings in the set-up and institutionalization of ICM. It is these institutional failings that in turn *generate* challenges within the ICM domain which ultimately lead to poor coastal governance.

Literature comments extensively on the value of ICM in the climate change adaptation domain. The difficulties associated with ‘operationalizing’ ICM does not bode well for our preparedness to respond to escalating climate change pressures such as sea-level rise and increasing coastal vulnerability (see Chapter Three). Through ICM’s broadly consultative process of engagement towards the configuration of institutional processes in achieving a common goal, one assumes that this process aims to achieve outcomes that are equitable and socially just. The next section presents a review on conceptions of social justice, and more specifically looks at the relationship between social justice and climate change from a coastal governance perspective.

1.5.5 Procedural justice in the context of coastal vulnerability

Procedural justice may be subsumed within the broader conceptual framework of social justice. As such it becomes necessary, if only briefly, to consider the theory of social justice. Social justice primarily relates to fairness and equity in the distribution of 'goods' and 'bads' (Miller, 1999; Novak, 2000; Sen, 2011; Sowman et al., 2016). Barry (2005) considers social justice to be a question of equal opportunities. Through a governance lens social justice is regarded as a system of principles that promote the equitable distribution of goods and bads through recognizing the right of governance actors to have a say in governance decision making (Dobson, 1999; McKenna, 1999; Jentoft, 2013). The value of social justice in the context of this research is appreciated given that it is an important governing condition – without justice, stakeholders are likely to rebel against governing efforts, whether it be in the distribution of resources, formulating property rights or promoting development (Jentoft, 2013). The importance of social justice as a governing condition is realized when one considers that the impacts of increasing variability of climate patterns will be borne unequally: indigent persons or communities, women, young children and the elderly are more vulnerable to the impacts of climate change (Rosenzweig & Tubiello, 2006; Karl, 2009; IPCC, 2014b).

The critique of social justice emanates from divergent philosophical positions held by social justice proponents of what it is and how it may be achieved in practice (Novak, 2000; Sowman et al., 2016). Cooper and McKenna (2008) argue that the diverse conceptions of social justice - and subsequent loose interpretations that may arise - make the concept susceptible to manipulation as a bargaining tool, whether for good intent or not. Novak (2000) explains that, in order to give social justice effect at the required scale – that of social systems - laws are required. Embedding the tenets of social justice in legislation however, runs the risk of becoming '...an instrument of ideological intimidation, for the purpose of gaining the power of legal coercion' (Novak, 2000:1). Similarly, Hayek (1979) suggests that conceptions of social justice at the scale of societal systems begin to take on a different meaning, not of a virtue, but rather of 'regulative principles of order,' and may, by extension, be leveraged to manipulate, enhance and control power relations.

Social justice may be distinguished according to which principles of justice are being pursued. These principles revolve around three main aspects; namely, the fair distribution of 'goods' and 'bads' as distributional justice in the present; restorative justice, whereby temporal dimensions are given

consideration in the re-distribution of goods and bads through addressing sustainability concerns; and finally procedural justice which emphasizes fair and inclusive decision-making processes whereby non-government actors are drawn into governance processes (Hardin, 1987; Jentoft, 2013). Dobson (1999) proposes that, provided procedures are inclusive and fair, the outcomes (i.e. whether they are considered to be equitable from a distributive or restorative perspective) are irrelevant. Thus Dobson (1999) argues that in pursuing social justice the emphasis should be placed on ensuring procedural justice.

Governance decisions in response to climate change pressures such as sea-level rise can generate benefits and burdens across both temporal and spatial scales. For example, the benefits associated with protecting communities against coastal erosion with sea defence structures (i.e. sea walls) include the protection of property adjacent to these defences, the preservation of beachfront lifestyles for such property owners and a likely escalation in the financial value of such properties (Cooper & McKenna, 2008). The burdens distributed as a consequence of sea walls include increased rates for the general public in order to fund and maintain sea defences, the deflection of energy to stretches of the coast 'downstream' of defence structures, negative impacts on coastal aesthetics, loss of the beach in the short to medium term, loss of the recreational and amenity value of that space and ultimately a loss of resilience (Clayton, 1993; Cooper & McKenna, 2008; Colenbrander et al., 2012; Sowman et al., 2016). The trade-offs that arise in responding to coastal risk invariably result in winners and losers (Campbell, 1996; Adger, 2001; Glavovic, 2013b;). The distribution of goods and bads associated with coastal vulnerability require a governance approach that is responsive and sensitive to the tensions and interests that exist between the various governance actors and the concerns they may have regards the distribution of goods and bads. Governance actors, such as members of civil society that have legitimate concerns, have the right to be heard in the process of resolving such concerns in a manner that is procedurally just (Haldeman, 2008). Procedural justice in its expanded form of broad and authentic participation at a societal scale may be considered as participatory democracy (Schlosberg, 2003), which is a normative principle of IG (Jentoft, 2013). The attainment of procedural justice is accordingly dependent upon societal systems – or institutions – that create enabling environments and opportunities from which to promote procedural justice. Thus debates on how to promote procedural justice should not be held independently of institutions, their design and mode of governance and how this may impact on procedural justice (Sen, 2009; Jentoft, 2013). The

relationship between government institutes, their mode of governance and procedural justice is discussed in more detail in Chapter Six.

Aspiring towards governance approaches that embody procedural and restorative justice for delivering broadly acceptable outcomes is intrinsically linked to, and made more complex by, historical circumstances. 'Restorative justice' is about making up for historical injustices. In South Africa, for example, normative governance goals are strongly orientated around notions of inclusivity and equity as a means to redress the inequalities of the apartheid era (Desportes & Colenbrander, 2016). From a coastal governance perspective, principles of restorative justice - people-centric and pro-poor - are being replicated in South African coastal legislation, manifesting in provisions such as promoting equitable access to coastal resources in perpetuity (Desportes & Colenbrander, 2016). Leck et al. (2011) present the argument that past injustices remain firmly entrenched in cultural memories and can present a formidable barrier to governance initiatives in responding to a changing climate. Marginalized communities may consider environmental protection - applied under the rubric of 'ecosystems-based adaptation' - as being about conserving nature for the benefit of a wealthy minority. Experiences within South Africa have demonstrated that interventions by government that apply principles of ecosystems-based adaptation have been constructed as 'apartheid reinventing itself under the guise of 'environmental risk management' concerns' (Colenbrander et al., 2012). The social and political construction of the environmental agenda can only be addressed through inclusive and participatory processes (Parnell et al., 2007). Such processes are largely dependent on the prevailing governance mode applied to a particular societal challenge.

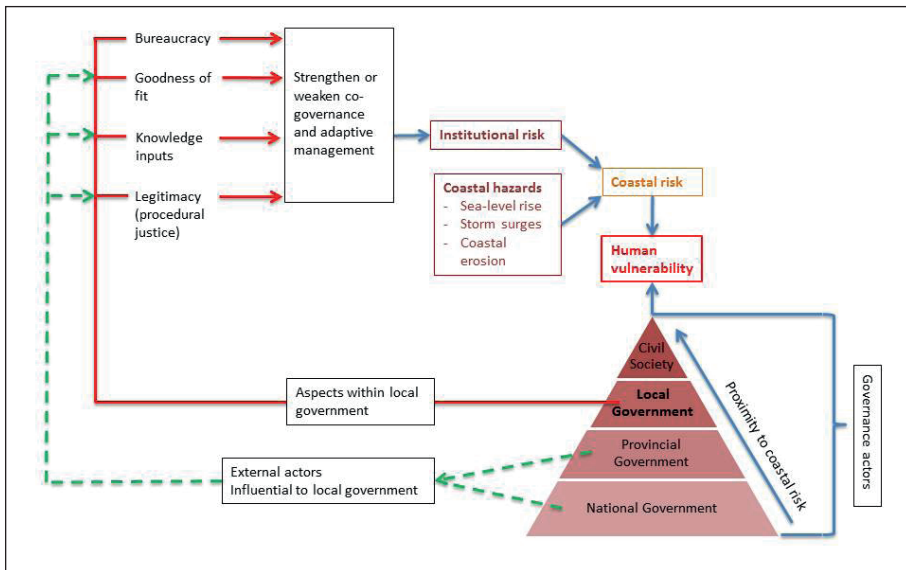
1.5.6 Conceptual framework

Figure 1.3 presents the conceptual framework that forms the basis of this research. It begins with the identification of the four main impediments to co-governance and adaptive management which are considered to be essential cogs for ICM and the governance of coastal risk.

These impediments, namely bureaucratic rigidity, poor goodness of fit, myopic knowledge regimes and lack of legitimacy lead to the institutional production of risk. This institutionalized risk coalesces with coastal hazards to generate coastal risk which in turn leads to human vulnerability. Civil society, in particular marginalized communities, are the most vulnerable as they are the closest in

physical proximity to coastal hazards. Local government, responsible for the provision of services, protection and maintenance of public infrastructure for community needs, ICM and the implementation of coastal adaptation strategies, is also in close proximity to these hazards. Institutional blockages however, undermine local governments' attempts at ICM and adaptive co-governance leading to governance inertia and ultimately the inability to respond to coastal risks and hazards. Other key governance actors, namely provincial and national government, are located further way from physical risk, yet they remain influential, and contribute to, institutional blockages evident at the local level.

Figure 1.3: Conceptual framework



(Source: author)

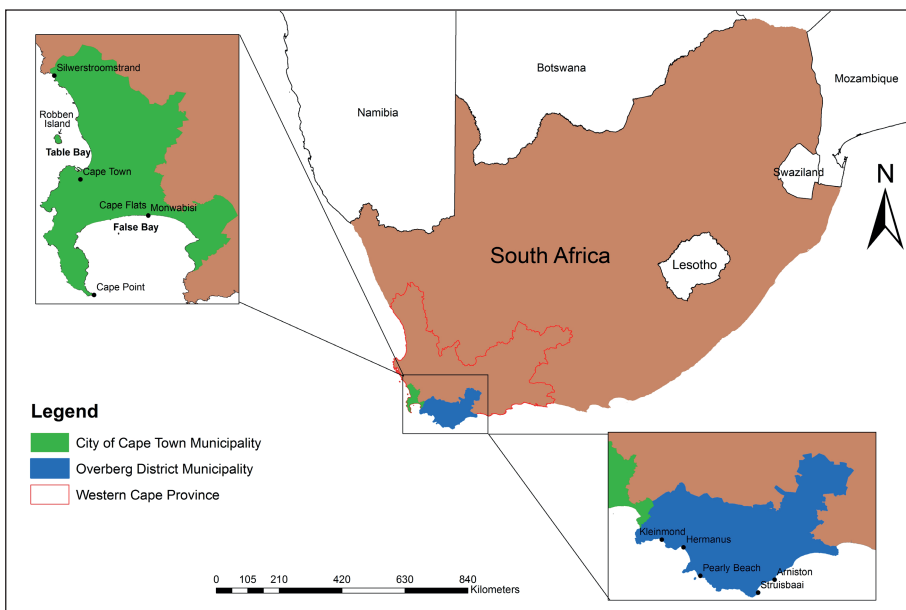
The various methods applied in this research – organizational ethnography, participatory action research and argumentative discourse analysis (see section 2.4) - were effective in ‘unearthing’ the various deficits and impediments within governance processes in the coastal risk and vulnerability domain. These same frameworks were used to explore ways in which improvements could be made to address these deficits and blockages. This process in return set the foundation for contributing to knowledge in the governance of risk and vulnerability at the local level (see section 7.4 of Chapter Seven).

1.6 Case study

1.6.1 The City of Cape Town local government municipality

This dissertation focuses on the CCT as its main case study (Figure 1.4). Cape Town is located at the south-western tip of Africa in the Western Cape Province of South Africa. The CCT was chosen for a number of reasons. Cape Town is one of Africa's biggest economic hubs and is South Africa's largest coastal city in terms of sea frontage exposure and population (see section 1.6.4 for further detail on demographics). An economic assessment of the contribution of Cape Town's coastline to its GDP estimates the value to be approximately R40 billion per annum ($\pm 10.7\%$ to GDP/annum) (Urban-Econ, 2017). A case study of a particular erosion hot-spot in Cape Town revealed that should the beach be lost entirely to coastal erosion, the local economy stands to lose an estimated R150 million in tourism derived revenue per annum (Cartwright & Morgan, 2016).

Figure 1.4: Map depicting case study areas



(Source: author)

The CCT thus represents a local government municipality that is confronted with significant climate change related pressures such as sea-level rise due to its extensive and built coastline. The governance of coastal risk at the city scale forms the central theme throughout this dissertation, thus the CCT provides an appropriate case study. Cape Town is also representative of a 'global city' burdened with developmental challenges. The pursuit of these developmental needs is made more difficult given the vast socio-economic inequalities and disparities that exist within and between coastal communities and the dependence of these communities on coastal resources in contributing to coastal livelihoods. I am also an employee of the CCT and am therefore 'embedded' within this subject matter. I see my positionality as a strength in that it brings elevated insight into matters as defined in the research questions. I also have access to pre-existing socio-institutional networks, resources and data pools as well as fieldwork accessibility to coastal risks and hazards within Cape Town and South Africa. Finally, I am a South African and familiar with local languages and the various cultures in Cape Town. My positionality can however imply that there is a certain amount of bias in my writing. I have tried to avoid such a bias to the best of my abilities.

Although emphasis is placed on the CCT, this research does extend beyond the jurisdictional boundaries of the CCT to analyse other coastal municipalities, in particular that of the Overberg District Municipality (ODM). Acknowledging that neither the CCT nor any other local municipality functions as an autonomous entity but is subject to the influences of other institutions and actors within a much broader governance landscape, this research adopts a more expansive approach in considering 'externalities' at both provincial and national levels (see Chapter Five and Six for further detail).

1.6.2 History and governance structures of the City of Cape Town

Before detailing the history and structure of the CCT, it is pertinent to provide a brief description of the broader government structure in South Africa. This is necessary as CCT and its policies are embedded within, and influenced by, these structures. South Africa has a three-tier government, consisting of national, provincial and local spheres of government. Each tier has legislative and executive authority in their own spheres (Goble et al., 2014). The development and implementation of laws and policies as applicable to South Africa is a national government responsibility (Constitution of the Republic of South Africa, Act No. 108 of 1996). The provincial government is responsible for co-ordination, monitoring and support of local municipalities that fall

within its jurisdiction (Goble et al., 2014). Within South Africa there are nine provincial legislatures. Each legislature is responsible for enacting legislation for the regulation of activities that fall within the functional areas as defined by provincial boundaries to ensure good governance of those provinces (Constitution of the Republic of South Africa, 1996). Municipalities, or local government, are tasked with day-to-day management activities, such as the provision of basic services, land use and strategic planning, local economic development and environmental protection within their jurisdiction (section 156 of the Constitution).

The CCT is governed by a 221-member City Council. The CCT Council is both a legislative and executive body, with the Constitution of South Africa empowering the Council to make decisions on the power and performance of all the directorates and departments within the CCT. While the current form of the CCT is only 17 years old, it has a municipal governance and service delivery record that spans some 300 years (CCT, 2011). The first council meeting was held on a ship in Table Bay in 1652. In 1834 a legislative council was formed which then expanded to 11 local authorities by the 1900s. By 1994 it became apparent that this increased number of municipalities was leading to inefficient service delivery and wasteful expenditure, primarily as a consequence of the duplication of skills and resources (CCT, 2011). In response to this, the process of amalgamating local authorities commenced in 1994. From 57 entities to 8 in 1994, and finally to one 'mega' administration in 2000, the City of Cape Town Metropolitan Municipality was formed as it is today.

Within South Africa there are two mayoral systems of legislation, that of an executive committee system and the mayoral system. With the executive committee system the decision making and power rests with the executive committee. Members of the executive committee are allocated based on the proportional representation of political parties they represent (de Lille & Kesson, 2017). With an executive mayoral system, such as that held by the CCT, the power rests with the executive mayor. The executive mayor is, in turn, appointed by the Council. The CCT Council consists of a 221 member body, where members are elected from Cape Town's 111 electoral wards based on simple majority (CCT, 2011). The remaining 110 councillors are chosen based on a system of proportional representation from the 'lists' submitted by various political parties in Cape Town (CCT, 2011). Within the executive mayoral system, the members of the mayoral committee are appointed by the executive mayor. The powers held by members of the mayoral committee are also delegated to them by the executive

mayor. Members of the mayoral committee essentially play an advisory role to the executive mayor (de Lille & Kesson, 2017). The executive mayor, mayoral committee and the council effectively form the ‘political principal’ within the CCT, with the executive mayor positioned at the apex of the decision-making hierarchy. The executive management team, taking direction and guidance from the mayoral committee, are focused on achieving the CCT’s strategic objectives as defined in the IDP (CCT, 2011). The city manager provides a managerial interface between the executive management team and the mayoral committee and executive mayor (Figure 1.5 and 1.6).

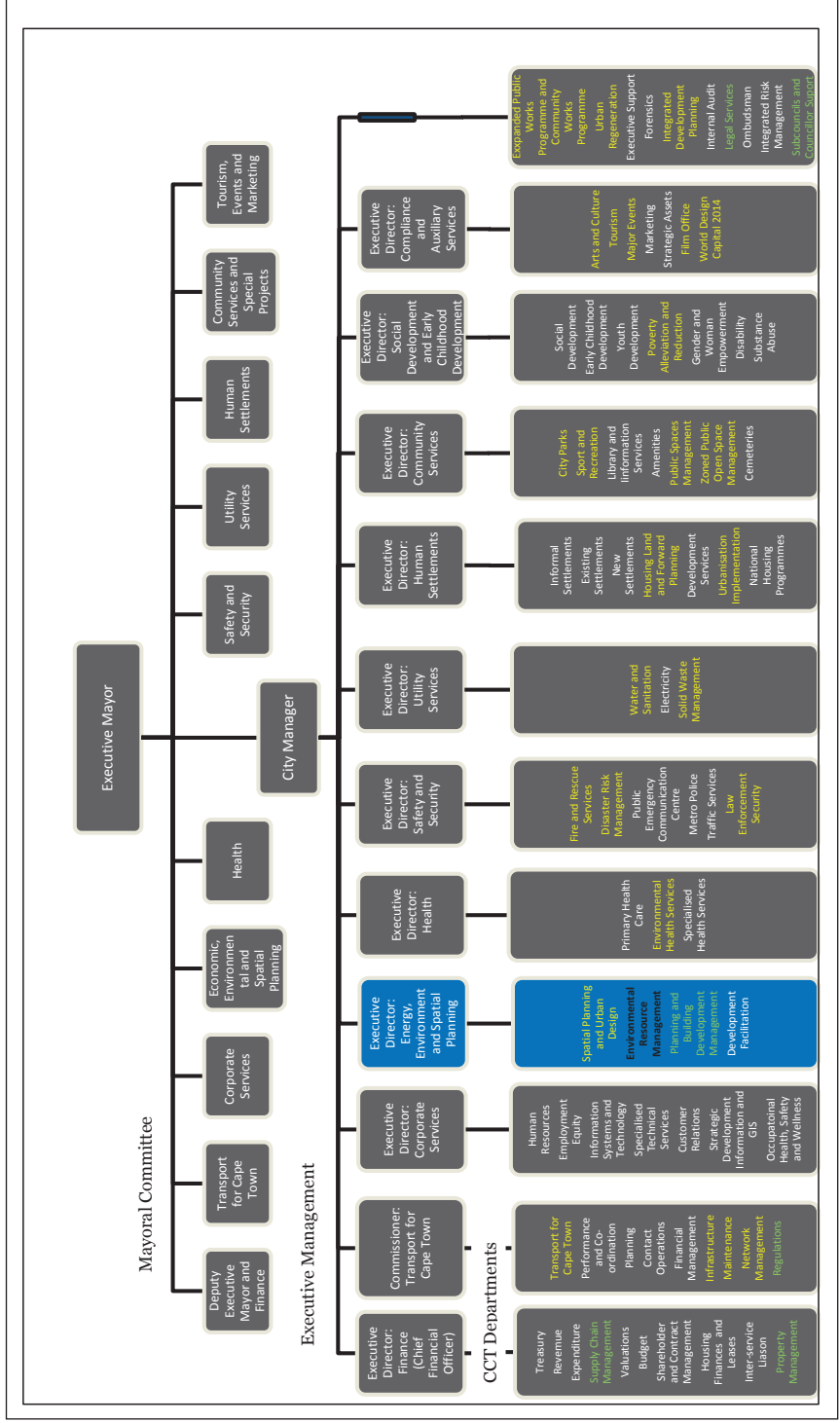
Figure 1.5: Occupational category and staff compliment for the City of Cape Town¹⁰



(Source: CCT, 2011)

¹⁰ These figures exclude temporary or contractual posts. The total number of employees in 2011 was 23863. In 2017 the figure was estimated at 27000 (CCT, 2011).

Figure 1.6: City of Cape Town organogram. Each department consists of different line functions/branches. The function of coastal management is located within the Environmental Resource Management Department, located within the Directorate of Energy, Environment and Spatial Planning. Departments highlighted in yellow have an impact on coastal management (provision of services) while those highlighted in green have an indirect (procedural/strategic) impact on coastal management.



The CCT is guided by the (IDP)¹¹ which was formulated in 2012 and is reviewed every five years. Defining its governance goals, the IDP forms the CCT's main¹² planning document that provides a vision and defines priorities from which to achieve its five strategic focus areas (CCT, 2011). Table 1.1 presents these focus areas and their objectives.

The five focus areas effectively represent the meta-governance principles that are used to inform the CCT's plans and policies. The objectives identified in the Opportunity City reflect the CCT's drive in pursuing a more modernized state. This is evident mainly through terminology such as 'economic growth', 'infrastructure-led economic growth' and 'development'. Elements of reflexive modernization are evident through reference to 'sustainable development'. The pursuit of a Safe City is reflective of the socio-economic disparities that exist within Cape Town and the underlying notion that communities with less access to resources are more vulnerable. Efforts at addressing this disparity in order to make Cape Town safer are undertaken primarily through improving service delivery and enabling access to resources for those communities most in need. The Caring City refers to the CCT's desire to ensure restorative and distributive justice through empowering previously disenfranchised communities (mainly through facilitating access to socio-economic opportunities) as a consequence of the apartheid experience. A major drive within the Caring City is ensuring clean and safe living environments. The Inclusive City places emphasis on addressing South Africa's exclusionary past through ensuring that the CCT is responsive and attentive to pressing societal challenges and that governance processes in responding to such challenges are procedurally fair. Finally, the Well-Run City emphasizes the importance of transparent, efficient and clean governance as required to optimize service delivery to its citizens. Reference to 'productive administration', 'financial prudence' and the need to eradicate corruption is activated in the CCT primarily through applying a rigid bureaucracy. Within the CCT, conventional forms of bureaucracy are perceived as the most effective second order governance structure from which to achieve these objectives (see Chapter Three) thereby fulfilling the intent of the IDP.

11 The IDP is valid for five years and is reviewed yearly. The last revision of IDP took place in May 2017.

12 While the IDP forms the CCT's main planning document, the CCT does draw on, and is informed by, a range of other plans and strategic frameworks as developed by other spheres of government (national and provincial) as well as other CCT directorates and departments (CCT, 2011).

Table 1.1: The City of Cape Town’s Integrated Development Plan strategic focus areas and objectives

The Opportunity City	
Objective 1.1	Create an enabling environment to attract investment that generates economic growth and job creation.
Objective 1.2	Provide and maintain economic and social infrastructure to ensure infrastructure-led economic growth and development.
Objective 1.3	Promote a sustainable environment through the efficient utilisation of resources.
Objective 1.4	Ensure mobility through implementation of an effective public transport system.
Objective 1.5	Leverage the city’s assets to drive economic growth and sustainable development.
Objective 1.6	Maximise the use of available funding and programmes for training and skills development
The Safe City	
Objective 2.1	Expanding staff and capital resources in policing departments and emergency services to provide improved services to all, especially the most vulnerable communities.
Objective 2.2	Resource departments in pursuit of optimum operational functionality.
Objective 2.3	Enhance information-policing with improved information-gathering capacity and functional specialisation.
Objective 2.4	Improve efficiency of policing and emergency staff through effective training.
Objective 2.5	Improve safety and security through partnerships.
The Caring City	
Objective 3.1	Provide access to social services for those who need it.
Objective 3.2	Ensure increased access to innovative human settlements for those who need it.
Objective 3.3	Assess the possible sale or transfer of rental stock to identified beneficiaries, using established criteria.
Objective 3.4	Provide for the needs of informal settlements and backyard residences through improved services.
Objective 3.5	Provide effective environmental health services.
Objective 3.6	Provide effective air quality management and pollution (including noise) control and programmes.
Objective 3.7	Provide effective primary health-care services.
Objective 3.8	Provide substance abuse outpatient treatment and rehabilitation services.
The Inclusive City	
Objective 4.1	Ensure responsiveness by creating an environment where citizens can be communicated with and responded to.
Objective 4.2	Provide facilities that make citizens feel at home.
The Well-Run City	
Objective 5.1	Ensure a transparent government, and work towards eradicating corruption.
Objective 5.2	Ensure an efficient and productive administration that prioritises delivery.
Objective 5.3	Ensure financial prudence, with clean audits by the Auditor-General.

(Source: CCT, 2011)

From a city-planning perspective the pursuit of these meta-governance principles resonates strongly with Campbell’s Conceptual Framework of the Planners’ Triangle (Campbell, 1996). Campbell argues that the pursuit of the triple bottom line, that of a green city, economically growing city and equitable city, are diametrically opposing principles (the basis of the

sustainable development critique) with trade-offs, and subsequent tensions, that need to be navigated in moving towards these ideals. As with sustainable development, the tensions that exist in pursuing the CCT's IDP principles are distinguishing features in the coastal risk and vulnerability domain (see Chapter Five). Thus the exploration of governance surrounding these tensions, and how governance may obstruct or enable the resolution of these tensions in moving towards sustainable development, is an important topic of enquiry.

1.6.3 Climate change risks

Cape Town has a Mediterranean climate with an annual average rainfall of between 560 mm and 1400 mm. With South Easterly winds predominating the dry summers (October – March), the average maximum temperature occurs in February at 29.9°C (Transnet, 2017). During winter months (April – September), the prevailing winds are North Westerly which are generated by mid latitude cyclones (also referred to as cold fronts). The impact of these cold fronts on Cape Town and South Africa are felt more acutely during winter months due to wind systems and pressure belts moving further northwards towards South Africa from the South Pole region. The average maximum temperature for winter occurs in July and is 17.7°C (Transnet, 2017). Recently published research by the University of Cape Town's Climate Systems Analysis Group (CSAG) applied a range of models, both Global Climate Models (GCMs) as well as downscaled models, to predict trends in climate change. All of the GCMs applied in the exercise projected natural variability for Cape Town's climate up until the period 2030-2040 after which almost all the models reveal a significant shift to a drier and warmer future (CSAG, 2016). Research by Tadross and Johnston (2012) reveal that since the 1960's, temperature indices for Cape Town have been gradually increasing. Cape Town is currently in the midst of its worst drought in over a century (CNN, 2017). Through the lens of the GCM outputs as applied by CSAG, and having received below average rainfall for the last three consecutive years (2015, 2016 & 2017), it is unclear whether Cape Town's drought is a consequence of natural variation or whether it is a consequence of anthropogenic induced climate change. Given that this drought is the worst Cape Town has experienced in over 100 years, it is less likely attributed to natural variation.

The existing drought in Cape Town is having a range of coastal impacts. For example the water quality in one of the city's west coast estuaries, the Diep River, has deteriorated to such an extent that it frequently exceeds

recreational water quality standards¹³ set by the National Department of Environmental Affairs (CCT, 2017a). This is attributed to less water ingress into river and estuarine systems, and therefore less dilution of pollutants entering the river system from waste water treatment works. The location and use of the Diep River estuary as a favoured recreational area presents significant health and safety risks to the public. The reduced water ingress has also resulted in the frequent silting up of the river mouth, resulting in ‘back-pooling’ and the increased potential for flooding of properties and infrastructure surrounding the river system. Wind regimes in Cape Town are also set to shift, increasing in intensity and shifting in directional prevalence (Tadross & Johnston, 2012; CSAG, 2016). Examples of impacts generated from warmer windier conditions include conditions more conducive to runaway fires and a reduction in the number of operational days in the Cape Town Port due to unsafe working conditions for cranes as well as for vessels departing and arriving (Transnet, 2017). Warmer and drier winds also lead to increased desiccation and die-out of vegetation (CSAG, 2016). The impact of this from a coastal perspective is the increased mobilization of sand from vegetated dune systems, and subsequent challenges of clearing accumulated wind-blown sand from critical infrastructure – such as road and railway-along Cape Town’s coastline (Daron & Colenbrander, 2015).

Advances in satellite technology and improvement of altimetry-based measurements have led to more accurate sea-level rise estimates (Goschen et al., 2009; Cazenave, 2010). Although eustatic sea-levels (globally) have been rising at different rates over the last 20 000 years (Fairbanks, 1989; Harvey & Nichols, 2008), a warming climate as a consequence of anthropogenic influences is considered the likely driver behind accelerated rates of rising sea-levels since the end of the 18th century (Jevrejeva et al., 2008; Church & White, 2011). Church and White (2011) estimate that the rate of global mean sea-level rise has almost doubled from $2.1 \pm 0.2 \text{ mm yr}^{-1}$ in the last decades of the 20th century to reach $3.3 \pm 0.4 \text{ mm yr}^{-1}$ in the first decade of the 21st century. The International Panel of Climate Change Fifth Assessment Report estimates that the sea-levels will rise by between 9cm-15cm by 2030, between 16cm-32cm by 2050 and 28cm-98cm by 2100 (IPCC, 2013). The rate of sea-level rise may differ on a regional scale due to influences in adjustments of landmasses, ocean dynamics and other regional or local phenomena such as currents, ocean temperatures and wind regimes (Goschen et al., 2009). Even

13 This is measured both in terms of *E.coli* and *Enterococci*.

within South African waters, the rate of rise on the west coast is different to that of the east. Mather et al., (2009) estimate that the sea-levels on the west coast are rising by rising by $+1.87 \text{ mm.yr}^{-1}$, the south coast by $+1.47 \text{ mm.yr}^{-1}$ and the east coast by $+2.74 \text{ mm.yr}^{-1}$. The variation in these levels is attributed to the differences in vertical crust movements between the east and west coasts of South Africa, and the different oceanographic processes occurring along the east and west coasts (Mather et al., 2009).

Cape Town, traditionally referred to as the 'Cape of Storms' (ACC, 2013), is particularly susceptible to climate change induced sea-level rise. With an extensive coastline of over 240km in length, where 75% of the surface area is developed within 100m of the HWM¹⁴, it is estimated that approximately R5 billion worth of infrastructure is at risk to temporary inundation from storm surge events (Cartwright, 2009). The total surface area that is considered to be at high risk from flooding is estimated at 25km² (Cartwright, 2009). The developed and 'fixed' nature of Cape Town's coastline means that such systems are, with an increase in sea-level rise, increasingly losing their resilience (Brundrit, 2016). Here responses to coastal hazards are met with more and more rigid defence structures as coastlines are increasingly exposed to erosive forces. The consequence of this is that beaches are no longer able to naturally re-align and be re-nourished (through slumping dunes) in the process, leading to their gradual deterioration. This decline in resilience is similar to the risk-protection-development cycle as described by Cooper and McKenna (2008).

The CCT's Draft Cape Town Adaptation Plan of Action (CAPA) identifies the following risks presented by climate change from a coastal perspective (CCT, 2017b):

- Increased periods of sustained wave chop in conjunction with pressure induced localized rise in sea water in False Bay, resulting in the increased exposure of coastal infrastructure to flooding and coastal erosion;
- Damage to and loss of critical CCT infrastructure and the subsequent disruption of service delivery;
- Damage to and loss of private property;

14 The position of infrastructure within a distance of 100m of the HWM is considered a crude proxy for exposure to risk from coastal hazards such as sea-level rise, wind-blown sand, storm surges, coastal erosion and other coastal processes.

- Saline intrusion and loss of arable land;
- Landward migration of estuaries and water bodies connected to the sea resulting in inundation of property, and
- Potential threat of storm surge coinciding with fresh water flood events. This may lead to increased levels of inundation at the interface of marine and fresh water systems i.e. canal outlets and estuary mouths.

In 2009 the CCT undertook a sea-level rise risk assessment where it identified 19 locations within Cape Town that are considered at high risk. Table 1.2 provides a list of these locations.

1.6.4 Developmental challenges facing the City of Cape Town

Cape Town is the legislative capital of South Africa. Contributing 11.1% to the national Gross Domestic Product (GDP), Cape Town constitutes the second largest economy in South Africa (CCT, 2009a). In 2011 the population of Cape Town was estimated at 3.7 million people, growing by 46% from 1996 to 2011 (CCT, 2015a). In 2014 the population was estimated to be 3.9 million people (CCT, 2016a). The Cape Town populous makes up 65% of the province's population thus forming the urban hub of the Western Cape. In 2005, the unemployment rate in Cape Town was 19.2%, in 2013 it was listed as 24.9% (CCT, 2016a) and in 2017 as 26.5% (Statistics South Africa, 2016). The majority of unemployed live in informal settlements (Rodrigues et al., 2006). Population densities within South Africa provide a proxy for income levels. Within Cape Town, and in low-income high poverty areas typical of informal settlements, population densities range from 100 to 500 persons per hectare. In high-income wealthy areas, population densities range from 0-50 persons per hectare (Turok et al., 2010). Although progress towards a unified and non-racial society has been made through the transition to a democratic state, the spatial legacy of South Africa's apartheid past remains a ubiquitous feature of the South African landscape (Colenbrander et al., 2013). The difference in population densities within Cape Town is reflective of a dual economy and stark differences in income earnings. When examined through Blaikie's Pressure and release model, poverty and inequality remain one of the root causes of socio-economic vulnerability in South Africa (Blaikie et al., 1994).

Table 1.2: Sea-level rise vulnerability in Cape Town

Location	Description of hazard
Melkbosstrand	Exposed to big swell, but with some shelter from offshore reefs. Beachfront development and dune removal is problematic.
Blouberg (Bay)	Sheltered behind Robben Island, the beach should be an area of sand accretion. However, extensive development has encroached too close to the waterline. Protection is needed.
Tableview beachfront	Exposed to big waves, where the Beach Road will become at risk. Protection is needed.
Milnerton Beach	Exposed to big waves and, at high tide, surging breakers. This is an eroding beach with a diminishing steep dune cordon. Potential major issue if the protection to Otto du Plessis Drive is lost.
Milnerton to harbour	Shadow zone, no big waves. Harbour construction has led to gradual erosion and set-back, with ongoing loss of coastal infrastructure. Sea wall needs constant maintenance. Oil pipeline is strategic.
Green Point & Sea Point	Exposed to big waves, but some shelter from offshore reefs. The coast is on an exposed wave cut platform at some height above the sea, but needs the protection of a strong sea wall requiring continuous maintenance.
Glen Beach	A small pocket beach with some protection. High value beach houses are exposed.
Camps Bay	This beach is exposed to big waves. Wide beach, but high sea levels can reach the Beach Road.
Bakoven cottages	Very exposed to big waves and wave run up, and constantly under threat, as the houses are low down and on a hard rocky surface.
Kommetjie	Very exposed as deep water close inshore. Development has taken place in the protective dune field, reducing its effectiveness.
Witsands	Very exposed single building in dynamic dune field.
Glencairn	Railway line running along a low wave-cut platform. Sheltered in shadow zone, but perhaps the foundations of the railway line in the backing wetland need continual maintenance.
Fish Hoek dune section	In shadow zone, but backing wetland may lead to vulnerability.
Kalk Bay	In shadow zone from southwest, but exposed to focusing from the south-east.
Muizenberg corner	In the edge of the shadow zone, but protected by a wide and very flat beach with spilling breakers.
Strandfontein – Baden Powell Drive / Treatment Works / Landfill.	Not too exposed but the road and the infrastructure are too close to the water's edge.
Monwabisi and Macassar Pavilions.	Exposed to surging breakers at high tide and during storm events, with erosion of dune field.
Strand (entire beach front).	Exposed beach with protection from offshore reefs, but infrastructure constructed close to water and poorly planned sea-walls.
Bikini Beach	In swell shadow, but infrastructure too close to water and needs protection. Beach sand erodes.

(Adapted from Brundrit, 2009)

Increasing rates of in-migration in addition to population growth is resulting in the current expansion of Cape Town's urban footprint by approximately 12km² per annum (CCT, 2016a). By 2030 it is estimated that 650 000 more housing units will be required, with the delivery of 6 100 units per annum needed to meet this target (CCT, 2016a). However with a backlog of approximately 330 000¹⁵ housing units and demand outstripping supply, informal settlements are growing at approximately 13% per annum (CCT, 2009a). Similarly, the number of indigent households demonstrated an increase from 250 000 in 2003, to 288 703 in 2013 (CCT, 2016a). Household sizes are also decreasing. In 1996 the average household size was 3.72 persons per house, and in 2011 it was 3.5. Smaller households and a growing population translates into more houses with the demand for more services (CCT, 2016a). The rapidly changing demographics within Cape Town provides challenges to the CCT from a planning perspective: what form urban growth should take; where it should be located; and how to prevent urban sprawl and associated impacts of increasing travel time and costs, loss of agricultural land, and impacts on food security, as well as access to other economic and social opportunities (CCT, 2016a).

The challenges presented by a rapidly expanding city are compounded by Cape Town's physical geography. Bound by mountainous terrain and the sea, development initiatives are increasingly migrating towards, and along Cape Town's coastline. In response to rapid growth, unemployment and poverty, the CCT has launched a number of flagship development projects that are targeting coastal areas (CCT, 2009b). Indeed, a global city with a neo-liberal climate, the coast is framed as a valuable asset where coastal frontage property equates to economic wealth and gain. Here economic imperatives of development are largely influencing the nature and priority of government strategies, which in the case of Cape Town, are being directed most significantly towards the coastal zone (Colenbrander et al., 2013). While the coastal zone of Cape Town presents significant opportunities from a developmental and social upliftment perspective, paradoxically - in the context of climate change - it presents significant risks to the CCT. Thus the responsibility of promoting, and finding, the delicate balance between socio-economic upliftment through coastal nodal development while ensuring that such development is risk averse and sustainable is a central thread within the CCT's policy stance on coastal governance (see the City of Cape Town Integrated Coastal Management Policy, Annexure B).

15 As measured in 2009.

1.7 Structure of thesis

This dissertation comprises seven chapters. Chapter One provides the introduction and context as applicable to this research. Chapter One also includes the theoretical framework. Chapter Two focuses on the methodology applied in this research and covers aspects such as researcher positionality, ethics and specific methodological frameworks, in particular Organizational Ethnography and Participatory Action Research (PAR). Chapter Three presents the first of four peer-reviewed articles. Through the application of an IG framework, this chapter provides a detailed account on the blockages that exist ‘internally’ within a local government municipality – in this case the CCT - towards the institutionalism and delivery of ICM in structure and practice. Inclusive within this chapter is an analysis of the implications of a poor uptake of ICM and what the consequences are in terms of giving effect to climate change adaptation strategies. More specifically a link is revealed through second order governance structures as commonly employed in government; in particular bureaucratic forms of organization; and how such structures may in effect lead to the production of risk and mal-adaptive practices.

Chapter Four and Five provide a detailed account on the challenges of establishing CMLs. As a national and provincial policy prescript as well as a legislative mandate in terms of the ICMA, CMLs are considered as South Africa’s priority strategy for the governance of risk arising from coastal hazards. Here Chapter Four looks ‘internally’ within the CCT and reveals that such prescripts have dramatically underestimated the complexities and nuances that exist within local government and explores what this means for delineating and regulating CMLs at the local level. Chapter Five takes a ‘wide angle’ perspective and examines those ‘externalities’ within a broader governance landscape incorporating provincial and national spheres of government as well as the private sector, and how such externalities may shape, influence or impede the endeavours of local government to formalize CMLs. Here a comparative analysis is undertaken between the CCT as well as the ODM, the first two local governments that have attempted to establish CMLs in South Africa. Chapter Six, the last of the peer-reviewed articles, ‘steps back’ and instead of focusing on relatively specific issues and challenges surrounding CMLs, investigates the broader coastal risk governance landscape at a national scale. Here the relationship between the three tiers of government, as well as between government and civil society is examined. It further considers how these relationships are shaped, how the nature of

these relationships may influence the governance of risk at the local level, and the implications thereof. Chapter Seven provides the conclusion to this dissertation. The various lines of argument are drawn together providing a response to the research questions presented in the Introduction. Blockages to the governance of coastal risk at the local level are re-visited and summarized, causality and design is discussed in terms of what creates and perpetuates these blockages, and solutions to these blockages towards alternative risk governance pathways in developing city-scale contexts are suggested.

Chapter 2

Methodology

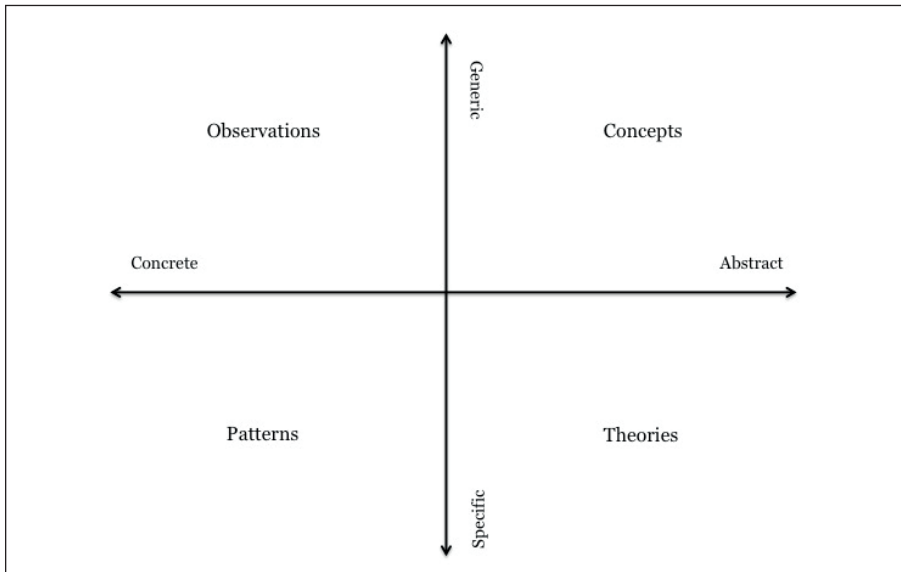
2.1 Introduction: considerations for knowledge production

This chapter presents the methodology applied in this research. This section (2.1) gives an account of those aspects requiring consideration in the process of contributing to knowledge. This is followed by a section (2.2) that reflects on my positionality and identity and what this means for this research. Section 2.3 identifies the main theoretical bodies used in this research, how the literature review was undertaken, and how I analysed and managed data from this review. Section 2.4 describes the methods applied in this research and section 2.5 provides the conclusion.

Falling within the discipline of the social sciences, this research applies a primarily qualitative means of analysis in answering the research questions posed in this dissertation. Qualitative research is generally case study orientated and is characterized by a small number of subjects. This qualitative research will be nested within methodological frameworks of both an organizational ethnography and a Participatory Action Research framework (PAR). These methodological frameworks have been chosen both on the basis of the topic of enquiry as well as my positionality as embedded within my own subject matter. Before detailing my positionality and specific method frameworks applied in this research, it is appropriate to reflect more broadly on social science research and how knowledge is produced and shaped through the research process.

In contributing to both theoretical debates and action-orientated solutions, Lund (2014) suggests it is important for the researcher to consider the question: what are research findings a case of? The relevance of this question extends beyond the intent of research in expanding knowledge, but also to consider and understand how the researcher's own bias and subjective interpretations may shape the production of this new knowledge. As Lund (2014, p.225) suggests, any social science research '...has the potential to be a case of many things depending on the configuration of our specifications and generalizations, and our concretizations and abstractions'. Lund (2014) presents a matrix (Figure 2.1) that describes research as a continually evolving process that shifts between concrete observations and the formulation of abstract concepts derived from these observations, and the comparison and testing of observed phenomena with broadly accepted theories and patterns.

Figure 2.1: The research matrix



(Source: Lund, 2014)

By oscillating between the various dimensions of the matrix, the researcher is able to build a case in responding to the query of ‘what is this a case of?’ Lund (2014) suggests that conclusions derived from research are nested within a hierarchy, where concrete conclusions based on a wealth of evidence are context specific. Conversely, more general conclusions aligned to theoretical debates will be more abstract and ‘de-contextualized’ with a correspondingly decreasing degree of relevance to the specific context. The challenge remains that when conducting research with the intent to contribute to knowledge, the contextual nuances are not lost in deriving general conclusions. In a pragmatic sense this resonates with the challenge presented by formulating policy prescripts in response to particular governance challenges, and where such prescripts are directed towards the local level.

The tension between contributing to theoretical knowledge while limiting the ‘de-contextualization’ of such knowledge must also be considered in the context of the PAR framework (see Section 2.4). A weakness of PAR lies in the difficulty of extending social theories emanating from the local scale to broader scales as necessary for societal transformation (Hickey & Mohan, 2004; Burns, 2007). This critique again brings to the fore the tensions that arise between converting

knowledge generated from the local scale to theoretical debates necessary for broader scale transformation, but ensuring such knowledge and/or theories remain sufficiently contextualized. In this regard I have been particularly sensitive in determining recommendations for exploring and mobilizing alternative governance pathways that are lodged within theoretical debates, yet ensuring that such knowledge remains relevant and ‘connected’ to the ‘realities’ of risk governance at the local level.

2.2 Author positionality and knowledge co-production

2.2.1 Positionality

I have been employed by the CCT since July 7, 2008 within the Coastal Branch of the Environmental Resource Management Department (ERMD¹⁶). Currently I hold the position of *Head: Coastal Policy Development and Management Programmes* within the Coastal Management Branch (CMB) of the ERMD. The CMB forms the loci of ICM and coastal adaptation within the broader CCT organizational structure. My responsibility within the CCT is to drive ICM both internally across multiple CCT departments as well with external entities, including provincial and national spheres of government and civil society. I represent the Coastal Branch as well as the CCT on a range of collaborative forums both within the CCT and externally. These ICM forums are referred to throughout this dissertation and include the following:

- **The Cape Town Transversal Coastal Working Group:**
 - An internal working group hosted by the Coastal Branch of the ERMD and which is limited to representatives from various CCT departments. This working group is designed to promote collaborative efforts across various departments within the CCT towards stronger degrees of ICM. I co-chair the Coastal Working Group.
- **The Western Cape Provincial Coastal Committee:**
 - A committee hosted by the Western Cape Province attended by representatives of all coastal municipalities falling within the Western Cape Province as well as representatives from national government departments, parastatals and research institutes. The intent of this committee is to provide a supportive role to coastal municipalities within the Western Cape and provide a linking platform between national and local spheres of government.

16 In 2017 the Environmental Resource Management Department was renamed the Environmental Management Department (EMD). For consistency sake it will be referred to as ERMD throughout this document.

- **Ministerial Technical Committee Working Group 8: Oceans and Coasts**
 - This working group effectively forms the National Coastal Committee as referred to in the ICMA and is hosted by the National Department of Environmental Affairs: Oceans and Coasts. The Working Group¹⁷ comprises representatives from the four coastal provinces, coastal municipalities, research institutes and parastatals as well as other departments from national government. Its intent is to facilitate engagement with key role-players towards the formulation of national policy and legislative frameworks.
- **The Coastal Spatial Planning Working Group**
 - This working group is hosted by the National Department of Environmental Affairs: Oceans and Coasts and comprises representatives from the four coastal provinces, coastal municipalities, various national government departments and research institutes. Its intent is to facilitate collaborative governance surrounding the competency of coastal spatial planning.

I occupy a central location within the coastal governance landscape both within the CCT and more broadly across South Africa. My ‘embeddedness’ in my own subject matter is not seen as a weakness leading towards subjectivity, but rather an asset through delivering elevated insight into the governance landscape that would not otherwise be achieved through third party external observation. Being embedded within one’s own subject matter where the boundaries between the researcher and the researched are ‘blurred’ facilitates both a reflexive and deliberative process of engagement (Whyte, 1991; Kindon et al., 2008). Thus my positionality and the subsequent blurred boundaries that exist is considered a strength and is complementary towards the main method frameworks applied in this research.

My position as an embedded researcher departs from the traditional position of the researcher which views his or her subject as an external object. This is significant in that a researcher as an independent and ‘external’ party carries a powerful image constructed and maintained by discourses of ‘status and knowledge’. This status in turn legitimizes and reinforces new ‘knowledge’ and ‘truths’ claimed by the researcher. Grbich (2004) maintains that such an image is antithetical towards promoting reflexive modes of engagement and knowledge co-production (Grbich, 2004). Reflexive learning and the creation of feedback loops between academic and non-academic communities, or

¹⁷ Civil society is poorly represented on this platform and forms the main topic of enquiry in Chapter Six.

between theory and action, is considered a prerequisite for research aiming for developmental paths that are transformative and more sustainable (Mistra Urban Futures, 2016).

The influence of subjective interpretations on research outcomes may be amplified in contexts where the boundaries between the researcher and the subject matter are less evident. Lund (2014) suggests that researcher bias and interpretation may shape research findings in the interests of the researcher. This is especially true within action research where the researcher has a vested interest in 'doing things better' (Ozanne & Saatcioglu, 2008). The strengths associated with embedded researchers are thus largely contingent upon the ability of the researcher to continually engage in a 'positional reflexivity' (Macbeth, 2001). Applying positional reflexivity is important to remain mindful of the influence of the researcher and his or her own constructed interpretations from the research process (Kunda, 2013). Section 7.5 of Chapter Seven gives a more detailed account on my experiences of positional reflexivity and why this was useful in the context of this research.

2.2.2 Ethical considerations linked to positionality

My positionality as both researcher and actor as an employee of local government presented ethical considerations on two main fronts. The first relates to my loyalty to the CCT as my employer and to act in the interests of the public to which I serve. Many meetings have, and continue to be held, both within government and between government and civil society that focus on coastal risk and vulnerability. More often than not, and especially where meetings were held between the CCT and members of the public, discussions inevitably shifted towards the shortfalls and weaknesses of the CCT as the administrative authority responsible for responding to coastal risk and vulnerability. As an independent researcher this would be a non-issue. However, as an employee of the CCT, these discussions became difficult spaces to navigate. Some of these criticisms were (and still are) valid. However, agreeing to, or validating them, in public settings such as sub-council meetings (where the media are often present) had potential implications. These implications revolve around one's own career growth opportunities, as well as implications for the CCT's own reputation. This was an increasingly difficult space to navigate towards the end of this research where politics and infighting within the governing party has become increasingly evident within the CCT (see Democratic Alliance, 2018).

Undeniably there are governance deficits within the CCT, and these have been elaborated on throughout this dissertation which I have tried to frame as ‘constructive criticism’ (see Chapters Three, Four and Seven). There are of course also positives and strengths that are also reflected upon (see Chapters Five and Seven). In public meetings and between the CCT and other spheres of government it was necessary to closely consider what I said to give measured responses. This position certainly made it more difficult to encourage transparency and legitimate engagement between myself - as a government employee – and civil society.

The second ethical consideration relates to expectation. Through a purely research lens, discussions with civil society typically provided valuable sources of information with relatively low levels of expectation on the public’s behalf to resolve governance deficits. However, my positionality as a council ‘official’ automatically placed a greater degree of expectation on me. It was generally assumed and expected that I was empowered to address concerns and interests raised by civil society beyond that of research capabilities and objectives. This expectation was also frequently elevated into the party political domain, where councillors, as representatives of both a political party and communities they serve, placed certain expectations on me as the ‘official’. This ethical dilemma was crystallized in a recent meeting attended by various representatives from opposition political parties active within Cape Town, including the Economic Freedom Fighters (EFF). Queries were raised by opposition parties (in particular the EFF) about the lethargy surrounding the application of coastal development to uplift previously underserved communities in Cape Town (see prologue). Responding to this expectation as an individual was very difficult given that coastal nodal development is dependent upon multi-departmental collaboration towards achieving it, and a host of anomalies that can slow the process. For example, nodal development cannot take place without first having bulk service infrastructure – such as water provision – in place. This infrastructure requires significant investment and major construction works to take place prior to nodal development proceeding. It also requires adequate water supply, yet Cape Town is in the midst of a drought crisis. In such discussions it became a delicate balancing act of acknowledging deficits of the CCT as the administrative authority while simultaneously tempering expectations due to systemic and unpredictable challenges.

2.2.3 Knowledge co-production

As eluded to in section 1.3 on ‘gaps in literature’, knowledge as it relates to climate change is by-and-large produced in the global north. The critique of this knowledge base is that it emanates from ‘experts’ and scientists that are considered ‘upstream’ or ‘detached’ from governance challenges at the local level (Ziman 2000). Within South Africa, there is a similar ‘upstream’ generation and transfer of knowledge whereby peer-reviewed articles and technical reports produced by scientists at institutes for higher education form the knowledge base from which local government formulate their strategies. The influential role of external consultants and the transfer of similar techno-scientific forms of knowledge to government in South Africa is likewise acknowledged (Glavovic, 2006; Oelofse et al., 2006; Cartwright et al., 2012; Colenbrander & Sowman, 2015).

Cartwright et al. (2012. p.3) suggests that the limits of this traditional approach to knowledge production are ‘...particularly acute against the spectre of climate change, as specialist scholarly knowledge is generally too narrowly conceived to be immediately applicable to the systemic nature of climate change risk’ resulting in well-documented disconnects. Expanding beyond the domain of climate science, Schon (1995) and Harris (2002) suggest that academics are preoccupied with personal curiosities operating at spatial and temporal scales that are irrelevant to the local context. At the local level authorities and bureaucrats tend to operate on a day-to-day basis within their own ‘siloes’ designations, are resistant to change and are reluctant to engage with and resolve complex problems (Caiden, 1985; Schon, 1995). Freire (1970) considers the ‘top-down’ mode of knowledge production as a patriarchal-colonial paradigm. Similarly Dahdouh-Guebas et al. (2003) consider this mode as a form of ‘neo-colonial’ science. Beck (1992, p.4) suggests that reflexivity – as a two-way engagement of social learning – is ‘excluded from the social and political interactions between experts and social groups over modern risks, because of the systematic assumption of realism in science’. Further he comments that a two-way process of knowledge engagement is necessary for the negotiation between ‘...different epistemologies and subcultural forms, amongst different discourses’ as a means to derive different knowledges other than that held by scientists (Beck, 1992, p.5). The traditional mode of knowledge production (also referred to as ‘mode 1’ knowledge production - see Klein, 2014) emanates from a ‘clear-cut border and division of labour between science and society’ whereby ‘...science holds a monopoly over knowledge production’ (Pohl et al., 2010, p.67).

From a city planning and governance perspective, Evans and Marvin (2006) suggest that unless local level government – and the practitioner knowledge held by government officials - begin to inform and shape the characterization of research questions and that a two-way flow of knowledge between officials and scientists is encouraged, knowledge produced and subsequent responses to contemporary challenges of climate-change-induced pressures are likely to remain facile, fractured and ambiguous. In order to create a democratic and sustainable knowledge-society Whatmore (2009) and Lane et al. (2011, cited in Scottt et al., in press) argue that an alternative mode of knowledge production is required for urban governance in developing societies. Agenda 21 (Chapter 35.5) advocates that ‘the best scientific and traditional knowledge available’ must be used to create a ‘hybrid’ knowledge if we are to pursue sustainable and just societies. Methods that enable linkages between established sciences with the indigenous knowledge of different cultures are critical to this (Agenda 21, Ch. 35.7).

Although there are methodological challenges associated with the co-production of knowledge between academic and non-academic communities, in particular power differentials, merging different perspectives and re-negotiating previous orientations towards tackling the sustainability challenge (Pohl, 2010), the substantive critiques of ‘mode 1’ knowledge are fuelling shifts to a process whereby knowledge is ‘co-produced’ (Klein et al., 2001; Kasemir et al., 2003; Cundill et al., 2005; Hadhorn et al., 2006). Max-Neef (2005) suggests that the ability to make inroads into contemporary governance challenges such as climate change as a complex and wicked problem is contingent upon multiple ‘knowledge bases’ that must be generated from a diverse range of disciplines. This approach, or ‘mode 2’ knowledge production, requires an applied process whereby different knowledges i.e. tacit, community, practitioner, expert and academic are brought together in a trans-disciplinary process of engagement to form a new knowledge that is ‘socially robust’ (Gibbons et al., 1994; Nowotny et al., 2003). The influential role of the political principal in CCT decision-making (see Chapter Three) necessitates that:

Politicians should base decisions not only on scientific, but also on other types of knowledge and experiences. It is no longer enough to rely on science-policy platforms and processes, but necessary to develop trans-disciplinary approaches that involve the major players in society in defining problems, carrying out and disseminating research, and implementing the results. Through such a process, policies can become wiser, more evidence-based – ‘owned’ by both civil society and the private sector (Mistra Urban Futures: 2016, p.5).

It is implicit that the re-orientation of knowledge production through trans-disciplinary processes requires institutional backing to enable this. In recognizing the limitations of the traditional or 'mode 1' knowledge production model, the CCT entered into a formal partnership with the African Centre for Cities (ACC) at the University of Cape Town (UCT) as well as with Mistra Urban Futures¹⁸. The Knowledge Transfer Programme (KTP) (2012-2015) was established as part of this new partnership. This programme was designed with the intent to merge academic method and research with practitioner-orientated knowledge. This 'Mode 2' knowledge in turn, would be used in the formulation of policy responses and strategies to address sustainability challenges within the CCT (Scott et al., in press). Practically, this unfolded through an exchange programme whereby researchers from UCT (PhD students) were embedded within the CCT to carry out policy research of interest to themselves and the CCT. Selected CCT officials, including myself, were in exchange given the opportunity to take a 'practitioner sabbatical' at UCT working with academics to 'co-produce' peer reviewed articles¹⁹ based on their work and experiences within the CCT.

2.2.4 Researcher identity

Researcher identity is an important consideration when applying methodological frameworks, such as PAR, where the researcher is positioned as an actor seeking solutions to societal problems. The matter of identity is particularly important in the context of South Africa given its past of racial division and exclusion under the apartheid regime. In terms of the South Africa ethnic classification system, I am described as 'white'. Leck (2011) points out that as a relatively new democracy, cultural memories of oppression and exclusion by a white minority remain influential factors in the governance of cities in South Africa today. I am also located within the ERMD. Employees working within this department are colloquially referred to by other department employees as 'greenies' who have 'green' mentalities. Here 'green' mentalities, perceived to be held by those officials working within environmental fields, have been associated with exclusion and elitism (Cock & Fig, 2002; McDonald, 2004). The potential influence

18 Mistra Urban Futures is an international centre for sustainable urban development based in Gothenburg and is operational in three other cities around the world including Cape Town, Greater Manchester and Kisumu. A focal point of Mistra Urban futures is the co-production of knowledge for a sustainable urban future.

19 Chapter Five of this dissertation represents a peer-reviewed article as a product of this programme.

that researcher identity may have on this research in the context of South Africa's history is significant. It for this reason, and amplified by the fact that the researcher 'doubled' as an actor embedded within his own subject matter, that it was important to exercise a 'positional reflexivity' throughout this research process. This required that I consider 'place, biography, self and other to understand how they shape the analytic exercise' (Macbeth, 2001, p.35). I have certainly encountered aspects related to the influence of identity throughout this research process which has spanned five years. These moments are reflected upon in more detail in the concluding chapter of this dissertation (see section 7.5 on 'reflections on research methodology').

2.2.5 Subjectivity and the Interpretive Turn

The central intention of this research is to develop an understanding of coastal risk, to determine what contributes to the production of risk and how governance processes may be shifted or changed to better govern this risk. Methods used to explore and answer these questions include both an organizational ethnography as well as a PAR framework. The active stakeholder engagement required for the application of these frameworks to determine how coastal governance actors and institutions both conceptualize and respond to risk will be influenced and shaped by the researcher's own interpretation of actor perceptions surrounding coastal risk and the governance thereof.

The process of interpreting actor perceptions to understand behaviour is a 'double hermeneutic' i.e. within the social sciences the focus is not limited to how people act, but also how people understand their world and in turn, how this influences their behaviour. Giddens (1984, p.20) suggests that, within the social sciences, researchers tend to focus on the way in which '...lay concepts obstinately intrude into the technical discourse of social science' yet there tends to be neglect in considering the matter the other way around. Here 'the concepts of the social sciences are not produced about an independently constituted subject-matter, which continues regardless of what these concepts are. The 'findings' of the social sciences very often enter constitutively into the world they describe.'

The arguments presented in this research will be subjective. According to the Cartesian ideal of methodic doubting as popularized in Western philosophy by René Descartes, researcher subjectivity is seen as a weakness, leads to bias and ultimately misrepresents 'reality'. To achieve and reflect a more

'accurate' portrayal of the truth, and according to the doctrine implicit to positivistic science, social phenomena must be examined as external objects where there is a clear boundary between the researcher and the objects being researched. Mottier (2005, p.4) challenges this notion through arguing that:

...the goal of social sciences lies in the interpretive understanding of the subjective meaning of social practices and of cultural artefacts, within a life world that the researcher is embedded in. It follows that the study of social reality as an 'external object' is a methodological impossibility.

Mottier also presents the argument that given meaning '...is embedded in a specific historical and cultural context, the meaning of the object of research is irreducible to the cultural meanings that envelop the interpreter' (Mottier, 2005, p.4). In essence, aspects such as race, class, gender and the contextual circumstances that surround the research process can and do shape the nature of data generated from research (Mottier, 2005).

The acknowledgment of objective observation as a futile exercise has led to greater emphasis on the value of subjectivity in research. This shift towards an appreciation of subjectivity is referred to as the 'interpretive turn' where the process of data collection and interpretation is seen as '...a mutual construction of meaning where the researcher is engaged in "double hermeneutics"' (Mottier, 2005, p.1). Here 'double hermeneutics' refers to the process whereby the researcher constructs interpretations from interpretations. Within the 'interpretive turn' framework, and unlike positivist proponents of objectivity, interpretive researchers do not construct a boundary between the researcher and 'social reality'. Researchers instead become as much a part of the research as those being researched. Thus the information that is extracted from the research process amounts to a symbiotic construction of meaning (Mottier, 2005). The results generated by this research will be based on Mottier's (2005) 'symbiotic construction of meaning'. The acknowledgment of subjectivity within the research world is seen as a means of strengthening rather than weakening the validity of research (Mottier, 2005). My position within my own subject matter is seen as a strength in that it has provided elevated insight into the domain of coastal risk governance, certainly to degrees that would not otherwise have been achieved through the lens of a researcher not embedded within the CCT.

2.3 Literature review

The literature review identified four main theoretical bodies that are relevant for exploring alternative coastal risk governance pathways in developing city-scale contexts. The two predominant theoretical frameworks applied in this research are that of IG (Kooiman, 2003) and Beck's (1992) risk society. Bureaucracy (Weber, 1946) and nodal governance (Drahos et al., 2005) are examined within the IG framework. Beck's risk society is inclusive of theoretical writings on modernization and reflexive modernization. Climate change is framed as a contemporary risk, the product of the modernization process. Sustainable development (Mebratu, 1998 & Kates et al., 2005), adaptive management (Berkes & Folke, 1998; Adger et al., 2013) and ICM (Olsen, 2003) are considered extensions of reflexive modernization to counter the risks generated by modernized and modernizing societies. Social justice - see Sen (2011) and Rawls (2009) - and more specifically that of procedural justice, is also applied in the exploration of the governance surrounding vulnerable coastal communities. Although reference is made at times to accountability and the challenges associated with instilling it, to contain the scope of this research a literature review on accountability theory has not been undertaken.

An extensive literature review of over 30 journals dating back to scholarly writings from the 1940's (Max Weber's theory of bureaucracy) was undertaken. Articles from journals covered a wide spectrum of theories, from governance and government, ICM, political science, climate change and coastal risk, developmental studies and environmental policy. Keywords relating to these theories were used to search the various journals for relevant articles on the University of Amsterdam's website. While qualitative data analysis is 'largely an inductive, open-ended process that is not easily captured by mechanical processes of assembly-line steps' (Kitchen & Tate, 2000, p.30), some structure was applied to the collation and analysis of discursive materials. This involved the categorization of various sources of information, and the electronic filing thereof. A spreadsheet was built to give structure to, and systemically manage, information gained from the texts that made up the literature review. This spreadsheet (see Annexure C) was arranged into the following column headings: author, title/location, keywords, detail and page number. The 'author' column reflects the name of the author/s of a particular document and the 'title' column refers to the name of the document. The 'title' column was also used as a hyperlink for convenient and direct access to the document stored in a filing system on my personal computer. The

'keywords/notes' column was designed to facilitate quick scanning of the spreadsheet when having to refer back for more information. Linkages with other documents and/or theoretical bodies were also included in this column. The 'detail' column captured specific ideas within a document. Ideas and statements considered relevant to this research were highlighted as coloured text within the spreadsheet. Important texts within each of the documents were similarly highlighted. The 'Pg' column lists the page on which these ideas and statements were found within each of the documents. A number of spreadsheets were built per theoretical body i.e. risk society, social justice, IG, ICM etc. Within each spreadsheet per theoretical body, tabs were created to further refine themes within a particular body of knowledge. For example, for the theme of social justice, tabs were created for environmental justice, procedural justice and restorative justice.

2.4 Method frameworks

This research has adopted a primarily qualitative approach to assimilating and generating data. The application of qualitative approaches in the realm of social science is considered beneficial as it generates rich multi-layered material (Lubke, 2004). The application of qualitative approaches is similarly beneficial to a PAR framework in that 'the practice of qualitative research can be more usefully conceptualized as a form of bricolage: a putting-together of a set of research practices that aim to provide a solution to a concrete problem' (Mottier, 2005, p.2). In answering the questions presented in this research, and given my positionality as an 'embedded' researcher, both an organizational ethnography and a PAR framework were applied. The organizational ethnography, broadly speaking, was used to understand the 'why' and the PAR to determine the 'how to'.

2.4.1 Organizational Ethnography

For organizational ethnography to be applied, the subject matter must be classified as an 'organization'. An 'organization' according to Eberle and Maeder (2011, p. 57), refers to the '...process of ordering activities that are often pursued collaboratively, and sometimes to institutions, like corporations, state agencies or associations' and that '...any social phenomenon – a state of affairs as well as a process – that has orderly features can be called an "organization" or being "organized"'. The CCT as a local municipality charged with the responsibility of service delivery is considered as an organization as per this definition.

Organizational ethnography predominantly involves research into organizations in modern societies (Kitchen & Tate, 2000) and the critical evaluation of such an organization's promise and practises (Kunda, 2013). As globalization (and modernization) is changing traditional ways, cultural anthropology is losing its traditional object (Eberle & Maeder, 2011). Organizational ethnography thus provides an alternative method of conducting organizational studies through an anthropological methodology. It is a form of ethnography, which is essentially a multi-method approach that focuses on direct observation of the subject matter (Eberle & Maeder, 2011).

As similarly experienced by Kunda in his seminal work on *Engineering Culture* (2009), the application of an organizational ethnography presented me with the first major methodological headache. All research studies require proposals which are predicated on clear definitions of research problems, well-formulated hypotheses and structured methods. Ethnographic research however, is based on inductive logic and is perhaps guilty of applying vague scientific procedures (Kunda, 2009). The submission of a proposal at the outset of this research in the context of applying an organizational ethnography was a case of 'placing the cart before the horse' and led to similar queries raised by Kunda: how can a researcher plan to study that which a researcher will only know once research has commenced? The sequence of the proposal as the first step in this research presented me with significant challenges in identifying problems and formulating research questions. Fortunately, I have been in employment, and thus located within the subject matter, for three and a half years prior to submitting my proposal. Although challenging the rationale of a proposal, experience with, and insight into, the organizational workings of the CCT during this period was sufficient in formulating a proposal that was as close as possible a fit to my understanding of the research problem. Needless to say that when the formal research commenced and greater insight into the organizational workings of the CCT obtained, research questions and problems shifted slightly based on more purposeful observations.

An organisational ethnography consists of four basic activities: observing people and their activities; engagement with people to answer questions about their experiences within an organization in which they function; the collection and analysis of texts (including pictures, documents, representations of artifacts etc.) produced, displayed and 'operationalised' by the organization

being studied; and finally, devising a legitimate and comprehensive record of this (Kunda, 2009; Eberle & Maeder, 2011). My personal observations were focused on the everyday organizational functioning of the CCT to gain insight into, and understand the intricacies of day-to-day coastal governance challenges. Direct observation was applied to understand the ways in which actors and departments interact with each other and civil society, the nature and contents of communication between governance actors and civil society as well as the time frames of organizational processes. In addition to a literary review, a textual analysis of the following data sources over a period of five years (2012 – 2017) was undertaken (examples of these documents are provided in the annexures):

- Comments response reports from Public Participation Processes (PPP) in response to government-led initiatives relating to the coast (Annexure D);
- Reports and documents (both published and unpublished) including management instruments, operational protocols, policies, strategies and programmes (Annexure E);
- Meeting minutes (Annexure F), and
- Media clippings (Annexure G).

These sources of data were selected based on my own judgement as to how relevant they were to answering the research questions. All these sources of information were collected and filed. Some sources of information were stored electronically, while other sources, such as media clippings, were filed in hard copy format.

Personal observations were made from both informal and formal stakeholder engagement sessions. Informal stakeholder engagement relates to any form of communication between the CCT and civil society that is not considered part of a formal PPP. A PPP is guided by a set of politically approved standards and conditions within the CCT as per the requirements of the Constitution of South Africa. Informal engagements were wide ranging, varying from casual discussions with colleagues from various departments within the CCT as well as with other governance actors such as with civil society. Such casual discussions typically would take place after formal closure of meetings, in corridors, during site inspections, telephonic conversations etc. Notes and observations from informal discussions were captured in a diary.

The nature of ethnographic research is such that the methodology does not easily break down into distinct temporal stages of 'data collection', 'data analysis' and 'writing' nor can they be conceptually and practically distinct (Kunda, 2013). This was certainly true for this research whereby the three tasks became fused into an 'organic' process. Following from the inductive logic of ethnography, I undertook what came naturally: descriptive writings of this research came first based on my experiences, followed by criticism and interpretation, and finally structuring.

2.4.2 Participatory Action Research

A PAR framework was considered a potent and complimentary methodological framework for this research for the following two reasons. Firstly, the elevated insight gained into organizational workings through ethnographic research provided a solid foundation and valuable source of data from which to undertake a PAR. Participatory Action Research is a specific methodological approach that focuses on the identification of workable solutions to address existing concerns with the ultimate goal of improving human welfare (Ozanne & Saatcioglu, 2008). It is also used as a reflective process to improve strategies, practices and knowledge of the environment within which researchers practice (Kitchen & Tate 2000). Mackenzie et al. (2012) argue that social learning through PAR can build adaptive capacity. As revealed in section 1.5.4, adaptive capacity is a key requisite in ICM and the governance of coastal risk.

The data gained through the ethnography provided a valuable 'base' from which to undertake this action research. Understanding organizational deficits through the ethnographic process linked in with, and complimented, the intention of PAR: to improve the way things are done to the benefit of society. These method frameworks have also been complemented and strengthened through my own professional responsibility (and personal interest) to improve coastal governance in the CCT and South Africa more broadly. As such this method framework was used by myself, through engaging with a range of governance actors, observations and experimental approaches to identify deficits in governance, and to identify how government may address these deficits, towards improving the governance of coastal risk and vulnerability.

A potential Achilles Heel of the PAR framework is that researchers may either purposefully or inadvertently shape the production of knowledge towards achieving their own interests and or agendas (Ozanne & Saatcioglu, 2008). The scope for knowledge manipulation may be compounded given the potential for differing perceptions of priorities between the researcher and the community, the influence of politics and the differing ways in which researchers and communities may interpret findings (Baum et al., 2006). Further, Ger (1997, p.116) argues that while PAR is based on the premise that 'solutions lie in the local', he laments on the improbabilities of action researchers extending social theories that emanate from the local level to broader scales as required for social transformation. Similarly, Hickey and Mohan (2004) and Burns (2007) argue that by focusing on a local level of analysis, PAR runs the risk of failing to achieve broader shifts required for societal change. In the context of this research, this query translates into how lessons learnt from the CCT may be transferred to provincial and national spheres of government in South Africa, with their own differing functional and legislative mandates? How will the lessons learnt from the CCT as a developing city effect broader societal change as it relates to the governance of coastal risk globally?

In response to this Ozanne and Saatcioglu (2008), Brown and Gaventa (2010) and Gaventa and Tandon (2010) argue that provided institutional arrangements are established to facilitate analysis and joint learning across multiple scales, knowledge produced at the local level can and does shape national policies and global discourses. The Mistra agreement and the partnership with the ACC at UCT as elaborated in section 2.2.2. is considered a good example of this institutional arrangement and how such an arrangement can ensure that lessons learnt from the local level gain broader traction at scales necessary for transformative change. My participation in the Mistra programme has been effective in addressing the concerns raised with the PAR framework. The benefit of the Mistra agreement to this research, and the co-production of knowledge, more generally, receives further attention in section 7.3.6 of Chapter Seven. This is examined through enquiries into how institutions may be re-configured towards enabling 'mode 2' knowledge production, promoting knowledge transfer and uptake across different government institutes as well as between the government-civil society divide.

2.4.3 Argumentative Discourse Analysis

In addition to the organizational ethnography and PAR framework, this research has also applied an Argumentative Discourse Analysis (ADA). This method framework was however limited to Chapter Six, which duplicates as an article that has been accepted for publication in the *Journal of Environmental Planning and Management*. Before describing ADA as a specific method, it is necessary to first reflect on the term ‘discourse’. Simply put, a discourse may be described as the manner in which people understand, and talk about, the world, or an aspect of it (Scott, 2017, p.3). Hajer (1995, p.44) elaborates on this and considers a discourse as a ‘specific ensemble of ideas, concepts and categorizations that are produced, reproduced, and transformed in a particular set of practices and through which meaning is given to physical and social realities’. Meinhof and Richardson, (1994, cited in Hastings, 1999, p.10) define a discourse as ‘socially grounded interpretative frameworks ... (that act) as powerful forms of knowledge which structure what can be thought, said and done by social actors’. The link between discourse, knowledge and how this may influence what people may do is an important consideration and is particularly relevant in the context of this research. An environmental issue – such as the risk presented by coastal erosion - that is framed as a problem, is reflective of the interests and agendas of various actors. These actors include government, scientists and civil society that surround such a problem (Bird, 1987). Environmental discourses may be also framed as ‘knowledge regimes’ (Adger, 2001, p.683). These ‘knowledge regimes’, generated by a wide range of actors that may have common or different interests, in turn interact with, and influence, policy stances (Adger, 2001).

Hajer (1995) suggests that as different discourses may shape and influence policy stances, policy formulation is founded on, and shaped by, argumentative processes. Scott (2017) supports this in that argumentative processes take place in discussions and meetings as actors and actor coalitions position themselves in relation to a particular issue. Thus an ADA may be used to reveal ‘...a dominant political “truth” that in turn legitimizes societal intervention strategies by means of policies and policy instruments’ (Winkel et al., 2016 quoted in Scott, 2017, p. 13). These argumentative processes may be seen as political in that an actor or coalition of actors may endeavour to advance one discourse over another and thus shape the policy content in favour of such actors. Argumentative Discourse Analysis is applied in Chapter Six as a means to understand and identify dominant framings of coastal risk in South Africa and how such framings in turn shape and influence policy stances on coastal risk. Key sources of data for the ADA are drawn from public responses contained in public participation reports in

response to government-led coastal initiatives that have required public comment (Annexure D).

Chapter Six of this dissertation required an analysis of the White Paper on Sustainable Coastal Development in South Africa, South Africa's principal coastal policy. This analysis focused on the identification of prevalent policy vocabularies contained within the document. Policy vocabularies were used to contribute to the ADA. The identification of prevalent policy vocabularies involved a count of the number of times specific words or phrases were used in the policy. These policy vocabularies in turn were compared with vocabularies contained in South Africa's principle legislation, the Integrated Coastal Management Act (Act 36. of 2014), as well as with prevailing discourses held by state and civil society actors.

2.4.4 Quantitative analysis

Quantitative analysis was also applied in this research, albeit limited to Chapters Three and Six. This analysis focused on basic empirical investigations into the CCT's risk register to track the efficacy of the CCT in responding to, and resolving coastal risks (Chapter Three). These risks primarily included dilapidated public infrastructure that required repair, removal or upgrade. Chapter Six applies quantitative research through analysing the representivity of various governance actors on collaborative forums as hosted by national, provincial and local spheres of government. Secondary data based on qualitative research is used frequently throughout this research and typically includes information relating to rates of sea-level rise, identification of flood risk areas, economic valuation of Cape Town's coastline, property valuations, population censuses etc.

2.5 Conclusion

The methodological frameworks applied in this research have been selected and applied to capitalize on my positionality. These methods in concert with my position as both researcher and actor are considered a potent combination in revealing the intricacies and complexities associated within the topic of enquiry. Demonstrative of this is the role that identity may play. Not so much from the perspective of 'researcher' but importantly from the perspective of 'actor'. If it were not for my positionality as both 'researcher' and 'actor', intricacies of identity and the influence thereof in the coastal risk and vulnerability would perhaps be considered irrelevant or negligible. Yet Chapter Seven reveals that is not the case. Thus the combination of method frameworks, positionality, research topic, location and timing in the context of South Africa's transition to democracy has generated a rich output of research findings.

Chapter 3

Exploring the role of bureaucracy in the production of coastal risk

This chapter is a minor revision of the article:

Colenbrander D.R. & Bavinck J.M. (2017). Exploring the role of
bureaucracy in the production of risk, City of Cape Town, South Africa.
Ocean and Coastal Management. 150, 35-50.

3.1 Introduction: non-responsive governance in the face of dynamic pressures

Climate change is posing important new challenges for the governance of coastal cities (Brescia & Marshal, 2016; Francesch-Huidobro et al., 2017). These challenges primarily relate to coping with, and building resilience to, new extremes in climate shocks, such as drought, flooding, heat waves and storm surges (Hughes & Brundrit, 1992; Glavovic, 2013). The changing climate and associated impacts however requires that cities, to better respond to these pressures, reappraise their governance arrangements (Bulkeley & Betsill, 2005; Goedecke & Welsch, 2016). The cross sectoral and multi-dimensional impacts associated with climate change induced pressures (Holman et al., 2005; DEA, 2016), necessitates that governance responses are not only coordinated across vertical and horizontal plains within and between various departments and agencies, but that governance actors in themselves become more responsive, and adaptive, to a changing world (Carter et al., 2015; O'Brien & Selboe, 2015).

There are however barriers that may impede the required institutional shifts to new and innovative governance paradigms necessary to respond to contemporary challenges such as a changing climate. While innumerable in list, they range in scale and complexity, from financial constraints and regulatory barriers (Pasquini et al., 2015), divergent cultural world views (often shaped by historical contexts) and discordant beliefs surrounding climate change and subsequent conflicting policy stances (Leck et al., 2011; Akerlof et al., 2016), political emphasis on short term developmental goals over environmental protection (Brosius, 1999), and institutes, in particular those in government, that tend to remain static and unresponsive to external changes (Gunderson et al., 1995; Stankey et al., 2003; Fleischman, 2008; Myers & Kent, 2008).

It is the causality of the static or 'non-responsive' institute that forms the basis of this research. In the context of a coastal city and associated pressures driven by a warming climate such as sea-level rise, the lead question of this paper is whether bureaucratic forms of organization, as commonly found in cities, are capable of realizing the necessary level of integration and flexibility for responding to the challenges posed by a changing climate. Our enquiry is embedded in an understanding of risk society. Within a risk society, Beck (1992) theorizes that risks may be created within social systems, for example by organizations and institutions, where such organizations and

institutions are in themselves responsible for managing risk, or activities that may lead to risk. In such instances the adherence to bureaucratic rules may take precedence over the underlying organizational goals, resulting in the organization becoming dysfunctional or unproductive, finally leading to a 'bureaupathology' (Merton, 1957 cited in Giddens, 2001). In this sense the link between bureaucratic forms of organization and risk is not a trivial one. For a deeper analysis of this see section 3.2.4 'Bureaupathology and the production of risk'.

We focus on the City of Cape Town (CCT) Local Government Municipality, South Africa, which is expected to undergo serious impacts from climate change in the coming century (Climate Systems Analysis Group, 2016; Taylor, 2016; Cartwright, Parnell, Oelofse & Ward, 2012; Brundrit, 2009). While the CCT is aware of these risks, and is implementing an integrated management approach that combines protection with inclusive development, the effectiveness of its adaptation responses and sustainability in reality remains a challenge (Sowman, 2002; Davison et al., 2015) and instead may be leading to mal-adaptive impacts. This article aims to understand whether these impediments can be overcome through regular mechanisms of governance, or whether they are in fact – at least in part – a result of such mechanisms. In considering this introduction, this chapter sets out to answer sub-question ii (as presented in section 1.4 of Chapter One), namely: 'What is the relationship between governance structures as commonly utilized within local government, ICM and the production of coastal risks?'

The following section (section 3.2) presents a theoretical perspective on governability and the role of bureaucracy in contemporary risk society. Within this section, Integrated Coastal Management (ICM) as an increasingly valued management paradigm for enabling climate change adaptation responses (Chemane et al., 1997; Tobey et al., 2010; Falaleeva et al., 2011; Celliers et al., 2013) and some common difficulties in implementing ICM in bureaucratic environments is also discussed. Section 3.3 provides the background, section 3.4 presents the methodology and section 3.5 outlines the results regarding the CCT and its efforts at promoting more adaptive forms of governance through the ICM paradigm. We illustrate this by reference to the practice of rehabilitating and maintaining coastal dunes as one of the CCT's key coastal adaptation strategies (Cartwright et al., 2008). Section 3.6 discusses these findings in the context of wider literature.

The Bureaucratic Hymn, by Sir Francis Lindley (quoted in Nish & Cortazi, 1994, p.100):

*Thou who seest all things below
Grant that Thy Servants may go slow
That they may study to comply
With regulations till they die.*

*Teach us Lord to reverence
Committees more than common sense.
Impress our minds to make no plan
But pass the baby when we can.
And when the tempter seems to give
Us feelings of initiative.
Or when alone we go too far.
Chastise us with a circular.*

*Mid war and tumult, fire and storms
Strengthen us, we pray, with forms.
Thus will Thy Servants ever be
A flock of perfect sheep for Thee.*

3.2 Bureaucracy and the challenges of coastal governance

3.2.1 Governability and the coastal space

Within the interactive governance framework, governance is described as comprising three components, namely the governing system, a system to be governed, and a system of governing interactions which mediate between the two (Chuenpagdee et al., 2008; Kooiman & Jentoft, 2009; Kooiman & Bavinck, 2013). The governing system may be conceptualized into three orders, namely first and second order governance as well as meta-governance (Kooiman, 2003; Bavinck, 2005). First order governance activities consist of daily operational procedures coordinated and implemented by organizations towards solving societal problems and creating opportunities. Second order governance comprises institutional structures, which in turn guide and enable first-order governance activities (Jentoft, 2007b). These institutional structures take the form of agreements, rules, rights, laws, norms, roles and procedures (Chuenpagdee et al., 2008; Kooiman & Bavinck, 2013). Such structures are born out of normative governance principles where these

principles collectively form the third level of governance, that of meta-governance (Kooiman, 2003; Kooiman & Jentoft 2009; Peters, 2010).

Interactive governance advocates that the relationship between these orders of governance play a central role in determining the governability of a system. Governability is considered as the overall capacity of a governing system to effectively respond to, and deliver on, the challenges that systems-to-be-governed present (Jentoft, 2007b; Chuenpagdee et al., 2008). It is not unusual for the system-to-be-governed to exceed, in a manner of diversity, complexity and dynamics, the capabilities of a governing system (Kooiman & Bavinck, 2013). In such cases governing systems become limited in their effectiveness (Jentoft, 2007b). Unpacking this, Kooiman and Bavinck (2013) suggest that the governability of a system is dependent on the compatibility between the governing system and the system to be governed. The terms 'match' and 'mismatch' are used to describe this compatibility, and primarily relate to scale: spatial, temporal and organizational. For a governing system to handle a diverse, complex and dynamic system-to-be-governed, so too should the governing system reflect reciprocal characteristics (Kooiman & Bavinck, 2013). For example, and in relation to spatial compatibility where mobile natural boundaries define the spatial limits of a natural resource, administrative boundaries of the governing system should only be set at the extremes of the natural variation of that resource (Bennett et al., 2010). From an organizational and temporal perspective, Jentoft (2007b, p. 361-366) argues that the governing system and the system to be governed should bear similar structural traits i.e. they should be 'isomorphic' and 'mutually responsive' in that diverse, complex and dynamic systems-to-be-governed require the governing system to be sensitive, inclusive, flexible and of equal longevity.

Societal realms differ in their governance requirements: the governability of a public health system (Mayntz, 2003) is, for example, dissimilar from a capture fishery (Kooiman & Bavinck, 2013). This is a result of differing goals, with fisheries being interested in resource extraction and public health in the maintenance of human wellbeing. It also follows from different combinations of governing actors, as well as major variations in their systems-to-be-governed. A coastal zone with multifarious human activities that is faced by coastal squeeze is quite different again (Chuenpagdee et al., 2008). The latter, as a system-to-be-governed, is argued to show a low level of governability due to its inherent complexity and dynamism (Cicin-Sain, 1998; Glavovic, 2006; Chuenpagdee et al., 2008; Kremer & Pinckney, 2012). The following

description presents a snapshot of this complexity, particularly as it relates to the multi-scalar dimension and connectivity of coastal systems:

The human activity sphere of the oceans obviously includes sectors such as fisheries, biodiversity, pollution, technology, climate and energy. Less obviously, though inevitably insofar as the oceans extend to coastal zones, the sphere includes human settlements (four people out of 10 live within 100 kilometres of coastlines), plus agriculture and industry, all being major sources of pollution. The sector can even include forestry insofar as deforestation of inland watersheds leads to siltation of port facilities. Deforestation also leads to a smothering impact from soil, silt and other debris washed off watersheds onto in-shore fisheries (Myers, 1993; Postma & Zijlestra, 1998 quoted in Myers & Kent, 2008, p.37).

The range of influences on coastal systems over varying temporal and spatial scales, often extending across differing administrative and jurisdictional boundaries, highlights this complexity. The impacts of climate change and expected environmental perturbations in the context of an Anthropocene are set to amplify these governance challenges (Glavovic et al., 2015).

3.2.2 Risk Society and climate change

Coastal cities in the postmodern era, such as Cape Town, are prominent exponents of what Beck (1992) has called risk society. Risk society is based on the premise that social change has taken place over a three-stage periodization. The first being pre-modernity, followed by simple modernity, and then reflexive modernity (Beck, 1992). Modernization takes place ‘with the claim of opening gates to hidden sources of social wealth with the keys of techno-scientific development’ (Beck, 1992, p.20). The modernization process is viewed as central to the upliftment of scarce societies, to societies of social wealth and industrial growth (Beck, 1992). Beck argues that an industrial society is however synonymous with a risk society. Here risk is defined as ‘...the probabilities of physical harm due to given technological or other processes’ (Beck, 1992, p. 4). Economic and technological ‘progress’ is being increasingly associated with the production of risks, where ‘...sources of wealth are “polluted” by growing “hazardous side effects”’ (Beck, 1992, p.20). The pursuit of modernity is releasing more and more destructive forces (Beck, 1992). Witness climate change as a product of industrialization in pursuit of modernity. Whilst industrialization drives the distribution of goods (wealth) towards economic emancipation, that of a risk society generates dangers.

Climate change, reflective of a risk manifesting in a postmodern era, presents an especially significant challenge from a coastal governance perspective. In 2013, the Intergovernmental Panel on Climate Change's (IPCC) Fifth Assessment Report estimated an upper boundary limit of 0.82m rise in the global mean sea-level by 2100 as a consequence of a warming climate (IPCC, 2013). This prediction was significantly greater than the IPCC Fourth Assessment Report that estimated an upper boundary limit of 0.59m (IPCC, 2007). This escalation is consistent with the rate of change in which sea-level has risen in the past: almost double the rate between 1993 and 2010 than between 1901 and 2010 (IPCC, 2013). The latest IPCC predictions are consistent with those trends in the southern Africa region (Brown et al., 2011), although there appear to be some regional differences in the rate of sea-level rise. Mather et al. (2009) reports that on the west coast of South Africa, sea-levels are rising at a rate of +1.87 mm.yr⁻¹ while on the east coast the rate is estimated at +2.74 mm.yr⁻¹. Based on these predictions an undesirable and high-risk state is unfolding: shorelines are receding as a consequence of rising sea-levels, yet the coastline is becoming increasingly developed and 'fixed' (Cooper and McKenna, 2008).

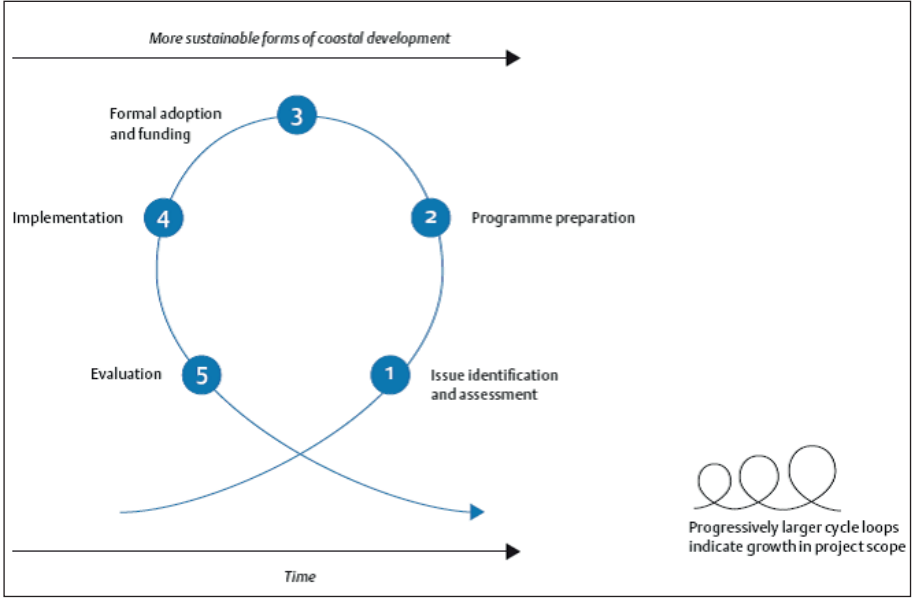
3.2.3 Governing coastal cities: bureaucracy and ICM, a mismatch?

Integrated Coastal Management is considered the most appropriate governance framework to match the contextual realities of the coastal zone, a requirement for more sustainable and risk averse forms of development (Bower & Turner 1998; Olsen, 2003; Cicin-Sain et al., 2008). The theory of ICM exhibits a degree of 'isomorphism' in that it is founded largely upon principles of adaptive management – where management systems co-evolve with socio-ecological systems change through learning about the system to be governed and responding accordingly (Johnson, 1999; Olsen et al., 2006) (Figure 3.1).

As a specific management paradigm, ICM is nested within and supported by broader governance structures (Chuenpagdee et al., 2008). As previously noted, second order governance structures, comprising rules, rights, norms, roles and procedures, are designed to enable and guide first order governance activities towards resolving societal challenges (Chuenpagdee et al., 2008; Kooiman & Bavinck, 2013). Kooiman and Jentoft (2009) however argue that second order governance structures, for example bureaucratic forms of organization, may in themselves disable the 'action potential' of actors at a first order governance level. Bureaucracy and governance are mutually dependent: bureaucratic

forms of organizational structure are required to set the platform to enable governance (Olsen, 2006). Thus the relationship between bureaucracy and governance, and how bureaucracy may shape governance outcomes, is an important consideration and warrants further research (Olsen, 2006). Indeed, there is evidence to suggest that bureaucracy can lead to an institutional inertia stalling the required shifts to more sustainable forms of development (Hajer, 2014). It is at this point that the relationship between bureaucracy and the ability of actors to perform ICM to achieve productive first order governance outcomes (i.e. sustainable and risk averse coastal development) becomes of interest.

Figure 3.1: Adaptive management cycles of Integrated Coastal Management as required for more sustainable forms of coastal development



(Source: Olsen et al., 2006)

Adaptive management is considered a central principle of ICM (Olsen et al., 2006; UNEP, 2009). It recognizes that static and inflexible forms of natural resource management are prone to failure (Holling & Meffe, 1996; Galat & Berkley, 2014; Berkes et al., 2000). Yet while there has been a growing recognition of the value of adaptive management post 1960's, government bureaucracies are considered largely inept at applying adaptive management

principles (Caiden, 1985; Stankey et al., 2003; Fleischman, 2008). Within the context of climate change, Adger et al. (2005a) note that as adaptive capacity decreases, vulnerability increases.

3.2.4 'Bureaupathology' and the production of risk

The intent of bureaucracy, in the classical Weberian sense, is to provide an institutionalization of legal rational authority towards democracy and good governance. Indeed the advance of bureaucratic forms of organization is due to its technical and systematic efficiency over any other form of organization (Giddens, 2001; Weber, 2009). An 'organization' in this sense is considered as an ordered and hierarchical means of coordinating activities, including the provision of services, in a collaborative manner, towards achieving a common goal (Weber, 1976 cited in Giddens, 2001; Eberle & Maeder, 2011). Most large organizations tend to be bureaucratic in nature (Giddens, 2013). The following characteristics are considered central to classical forms of bureaucratic organization (Merton, 1957, cited in Giddens, 2001; Weber, 1992; Lipsky, 2010).

- **Hierarchy:** the organization has clearly defined hierarchical structures of authority;
- **Rules:** bureaucrats within an organization are trained to rely strictly on written rules and procedures within the hierarchical structure; and
- **Specialization:** within the organization, jobs are differentiated to create specialist skills and administrative functions for pursuit of efficiency based purely on objective considerations.

Bureaucracies, within the public service sector, can and do perform well (Barzelay et al., 1992; Holzer & Callahan, 1998; Rainey & Steinbauer, 1999; Olsen, 2006). A bureaucracy is considered as the most efficient form of organization and the only way to deal with the administrative requirements of large-scale social systems (Weber, 1976 cited in Giddens, 2001). Indeed the value of bureaucratic organization is evidenced by its widespread growth and success within industrialized societies pursuing modernity (Ritzer, 1998; Giddens, 2001). In developing and low capacity countries, bureaucracy is prescribed as the most effective way to prevent maladministration of public funds towards building nations. Development agencies advocate bureaucracies for the same reason (Fukuyama, 2013).

While bureaucratic forms of organization provide a model of carefulness, precision and effective administration (Giddens, 2001), there is much literature that reflects on the demerits of bureaucracy. Bureaucracies have been known to become a catalyst for organizational deficiencies, poor performance of the governing system and ultimately their own internal failure. These failures are by and large attributed to the top down command and control structures (hierarchy) and subsequent loss of autonomy²⁰ in decision-making, excessive regularization (rules) and subsequent inflexibility. Specialization also generates a ‘silo’²¹ culture, with the defect being reduced integration and coordination (Downs & Rand Corporation, 1967; Warwick et al., 1975; Barton, 1979; Caiden, 1991; Fukuyama, 2013; Kooiman & Bavinck, 2013).

Caiden (1985) describes these internal failings of bureaucracy as an illness and coins the phrase ‘bureaupathology’, where he claims these failings are indicative of the pathologies or sickness of bureaucratic forms of organization leading to poor or failed governance and ultimately the production of risks. Caiden argues that organizations may not be aware of their own gradual bureaucratic failings, but eventually this may lead to broader organizational dysfunctions. When such dysfunctions are recognized, further bureaucratization tends to be applied resulting in an advanced pathology (Caiden, 1985). Similarly Merton (1957, cited in Giddens 2001) and Fukuyama (2013), suggests that this stage results in further bureaucratization of the organization, where the adherence to rules takes precedence over organizational goals. These excessively rule-bound organizations then tend to become slow moving, indecisive and result in an inertia and failure to achieve their very own mandate.

The poor track record of conventional bureaucracies in responding in more adaptive and innovative ways has led to a wealth of research seeking alternatives. Some of these prescribe formal structural changes, such as shifting from ‘rigid vertical command structures’ to flatter, more autonomous and collaborative models that are flexible and responsive (Giddens, 2001). Others are more informal and relate to procedural shifts. The establishment of ‘shadow’ networks is an example. Consisting of networks of informal relationships they make ‘...bureaucracies more permeable to new ideas,

20 Autonomy in this sense is defined as the degree to which the political principle (officials representing the political party in power) defines and issues mandates to bureaucrats as the agent of the political principle.

21 In this context a silo culture refers to departments with a common goal that work independently of each other, undermining the ability of an organization to achieve this goal.

providing a back door through which conceptual change can be introduced in a way that is not initially disruptive and provides a safe space for ideas to mature before being mainstreamed' (Leck & Roberts, 2015, p.62). A game of golf between business partners or post conference discussions at the bar are classic examples of more informal approaches towards building relationships and networking (Leck & Roberts, 2015; Giddens, 2001). From a coastal governance perspective, ICM recognizes the value of informal networks through initiating shifts away from rigid sectoral responses to more dynamic, flexible connections both vertically and horizontally within departments or between other governance actors (Sorenson, 1993; Portman et al., 2012).

3.3 Background to case study

3.3.1 The City of Cape Town: a bureaucratic organization

South Africa is a three tier governing state consisting of national, provincial and local (municipal) spheres of government. Municipalities form the smallest autonomous administrative unit tasked with providing basic services to the citizens of South Africa. Municipalities in South Africa underwent a significant restructuring after the transition to a democratic state in 1994 (Parnell, 2002; Van Donk, 2008). A move towards a fully democratic government to distribute resources more equitably over expanded geographic areas was necessary to reform '...an array of fragmented local administrations with disparate tax bases and technical capabilities designed to serve distinct racial groups...' (Turok, 2014, p.749). In Cape Town this process led to the formation of seven municipalities in 1996 and finally the CCT in 2000. The CCT is the legislative capital of South Africa, forming the administrative and economic centre of the Western Cape Province and Africa's third largest economic hub (CCT, 2011). The CCT administers a coastline of 240km's (149 miles) in length, covers a surface area of approximately 2445km² and has a total staff compliment of just over 25000 employees with an operating budget of R22.1 billion (\$3.3 billion) and a capital budget of R5 billion (\$793 million)²² (CCT, 2011).

The organizational structure of the CCT closely resembles that of a bureaucracy in the classical Weberian sense: hierarchical structures, specialization and the presence of rules. The CCT has a clearly defined top-down chain of command (hierarchy) reflected as the Executive Structure.²³ It is the Executive

²² The exchange rate on the 1st of July 2011 was R6.63 to the dollar.

²³ For an overview of the CCT's Executive Structure, see CCT, 2014a.

Mayor's responsibility, at the apex of the Executive Structure, to monitor the CCT's administration, review the CCT's performance and identify the needs of the municipality (CCT, 2011). The Executive Management Team (EMT) implements the decisions taken by Council. The EMT consists of executive directors heading 11 directorates; each with various departments with their own dedicated budgets focusing on their own defined roles and responsibilities. This is in conformance with the basic principle of bureaucratic specialization. The channels of communication within the hierarchy, and the pursuit of the CCT's mandates, are in turned guided by legislation such as the Municipal Finance Management Act²⁴ (Act 56 of 2003), representative of the 'rules'.

3.3.2 Governance challenges of a post-apartheid coastal city

The effects of South Africa's racially divided past are still being felt. The spatial and economic legacy of apartheid planning under the Group Areas Act (Act 41 of 1950)²⁵ remains a ubiquitous feature of the South African landscape and is particularly pronounced in cities. Within Cape Town, population densities, as a proxy for income groups and associated levels of poverty, range from 1228 people per km² (high income groups) to 150 000 people per km² reflecting extreme poverty (Turok et al., 2010). There has been very little shift in the spatial configuration of these densities since South Africa's emergence as a democratic state in 1994. In 2010 there was a housing backlog of approximately 330 000 housing units. With the CCT constructing on average 25 000 low-income housing units per annum, and with population growth and in-migration, demand is outstripping supply. As a result, informal settlements are growing by 13% per annum (Turok et al., 2010).

With a population of 3.8 million people, and a coastline of 240km, the CCT forms the largest coastal municipality in South Africa. Cape Town is recognized as Africa's leading tourism, investment and lifestyle destination (CCT, 2011). The coast of Cape Town arguably forms its most important socio-economic and environmental asset (CCT, 2012a; CCT, 2012b), valued at approximately R77 million²⁶ per annum (de Wit et al., 2009).

24 There are a variety of legislative mechanisms that regulate the manner in which local government functions. The Municipal Finance Management Act represents a single set of rules designed to ensure that local government in South Africa applies sound, sustainable and transparent management of financial affairs.

25 The Group Areas Act was used to assign different racial groups to different business and residential areas.

26 This figure reflects only a fraction of the Total Economic Value (TEV) as it is based purely on the cultural value of beaches alone in Cape Town. It does not reflect the regulatory, provisional and support value that coastal ecosystems provide.

Paradoxically the coastline also increases the CCT's risk profile (Colenbrander et al., 2015). Historically known as the 'Cape of Storms' the coastline of Cape Town is a high energy, dynamic and storm-prone coastline particularly vulnerable to the impacts of climate change induced sea-level rise (Cartwright et al., 2012). A sea-level rise risk assessment identified 17 locations in Cape Town that are considered especially vulnerable to storm surge events within the next 25 years (Brundrit, 2009). Totalling an area of approximately 25km², it is estimated that R5 billion (\$793 million)²⁷ worth of infrastructure is at risk within this area (Cartwright, 2008). As a crude proxy of the CCT's vulnerability to storm surges, 75% of the length of Cape Town's coastline consists of infrastructure falling within 100m of the high-water mark.

Through the vehicle of physical development, the coastline is seen as a valuable resource from which to leverage economic and social upliftment opportunities as a means to redress the inequalities of South Africa's past as committed under the apartheid regime (CCT, 2009b). In this context, it is essential that such development is inclusive, whereby it '...includes marginalized people, sectors and countries in social, political and economic processes for increased well-being, social and environmental sustainability and empowerment' (Gupta et al., 2015, p. 546). Historical planning decisions in Cape Town have, however, resulted in inappropriate coastal development in some areas and the subsequent generation of socio-economic risks such as those evident at Macassar Pavilion (CCT, 2012a). With an underestimation of the dynamic nature of Cape Town's coastline by CCT planners, the Macassar resort (located in False Bay) has become smothered in migrating sand dunes and has partially collapsed from erosion. Standing derelict, it not only requires significant funding (from the public purse) for its demolition and removal, it also harbours social ills such as crime and drug abuse (CCT, 2015b). These social ills in turn affect local communities who depend on recreational and amenity value of Macassar as their nearest beach.

Wary of these past mistakes, a distinctive dichotomy within CCT planning circles has arisen: how can the CCT drive social upliftment through inclusive coastal development as a governance priority, but simultaneously avoid socio-economic risks from coastal processes and sea-level rise? (Colenbrander &

27 This cost estimate is based on the entire 25km² being inundated. However Cape Town's coastline is not homogenous and flooding events are likely to take place in pockets determined by the particular characteristics of storm surges i.e. wind and swell direction, significant wave height, timing in relation to tidal fluctuations etc.

Sowman, 2015). The challenge presented here is not dissimilar to Beck's (1992, p.19) original question posed in the context of a risk society: 'How can the risks and hazards systematically produced as part of modernization be prevented, minimized, dramatized, or channelled? Where they do finally see the light of day in the shape of 'latent side effects' how can they be limited and distributed away so that they neither hamper the modernization process nor exceed the limits of that which is 'tolerable' – ecologically, medically, psychologically and socially?'

3.3.3 Is the governance response working?

A review of the CCT's Integrated Metropolitan Environmental Policy²⁸ (IMEP) five years after its implementation in 2003 found that '...integrating sustainability into institutional policies, practices and actions remained a significant challenge' (Davison et al., 2015, p.4). Further, in an attempt to redress the failure to mainstream sustainability principles, including those of ICM, the City of Cape Town Environmental Agenda 2009-2014 was approved in 2009. While it included a set of targets to be met by 2014, their achievement has been irregular with very little evidence of improved integration between departments (Greyling et al., 2013; Laros, 2013). Indeed, a review of the IMEP revealed that a lack of integration between CCT departments was the prime culprit behind the widening policy-implementation gap (Davison et al., 2015). This was attributed to the configuration of municipal departments as 'relatively disconnected silos' (Davison et al. 2015, p. 5). Laros submits that the absence of a central coordinating committee to facilitate collaboration between disparate departments as well as the absence of a 'environmental sustainability champion' at an appropriate level are strongly implicated in the policy implementation gap (Laros, 2013, quoted in Davison et al., 2015, p.11).

In addition to the IMEP review, an organizational assessment in respect of the CCT's coastal governance performance was undertaken, revealing similar findings. Key issues were noted as a lack of accountability, departments working in isolation compounded by their geographic separation in space and a lack of a centralized forum to promote interaction between departments (SSI & the CSIR, 2010). These elements, together with the absence of a clear policy directive promoting collaborative governance of coastal resources, were resulting in poor integrative efforts between departments (SSI & the CSIR, 2010). Further the influence of politics and the continual restructuring

²⁸ The IMEP provides a framework for mainstreaming sustainability in the CCT.

of CCT directorates were considered an impediment towards achieving effective ICM in Cape Town (SSI & the CSIR, 2010).

In response to these organizational challenges, both the IMEP and the coastal governance review recommended that a formalized space for creating accountability, to facilitate cross departmental collaboration and to provide a platform for negotiation and ultimately consensus building in strategic, high level decision making, be established (SSI & the CSIR, 2010; Laros, 2013). On this basis the Strategic Policy Unit (SPU) and the Coastal Working Group²⁹ were established in 2012 and 2014 respectively. The SPU intends to promote high-level policy integration and alignment through working across line departments and providing a central 'clearing house' for policy formulation (Davison et al., 2015). The CWG aims to promote ICM through lateral and vertical integration between CCT departments, the political principal, and strategic and operational staff (CCT, 2014c). Both the SPU and the Coastal Working Group are representative of second order governance initiatives.

3.4 Gauging Integrated Coastal Management within the City of Cape Town

In order to understand the impact of bureaucracy on ICM and coastal adaptation, it is first necessary to determine the effectiveness of ICM within that organization. It is also useful in understanding the impacts of institutional interventions, such as collaborative forums, in promoting ICM. Drawing from Ehler's (2003) approach, ICM may be measured through a combination of two indices, namely one made out of input indicators, and the other output indicators. Input indicators include elements such as the creation of institutional arrangements for planning and implementation purposes, capacitation, policy formulation, regularizing activities, adoption of management programmes, development of coastal management plans etc. Outcome indicators include those elements that reflect 'on-the-ground' change, such as improved water quality, increased access to beaches, decreased habitat loss, land restoration or degradation, increased resilience to environmental change (Ehler, 2003).

²⁹ The Coastal Working Group forms part of a larger Transversal Management System comprising multiple working groups represented by all departments within the CCT.

3.4.1 Input indicators: organizational achievements

Table 3.1 provides a timeline indicating the various input indicators over the last 15 years that have been achieved within CCT.³⁰ These input indicators were determined from an analysis of written documents produced by the CCT that relate directly or indirectly to enhancing ICM.

The range of input indicators suggests that the CCT has made significant inroads towards achieving increased degrees of ICM over the last 15 years.³¹ Certainly, in terms of achieving the input indicators as required by South Africa's Integrated Coastal Management Act (Act 36 of 2014)(ICM Act), the CCT has excelled (Celliers et al., 2015). However, as Ehler (2003) intimates, gauging ICM requires both the use of input and output indicators. This requirement of analyzing both input and output indicators is necessary, because although success may be achieved in creating and achieving input indicators, it does not necessarily translate into the desired change on the ground (Ehler, 2003). Although there are a host of outcome-orientated indicators relating to broader social, economic and environmental aspects of ICM, this article focuses on two output indicators. The first includes the efficacy of the CCT at responding to and addressing coastal issues (typically repair and maintenance of coastal infrastructure, as reflective of service delivery) and the second being the rehabilitation and maintenance of functional dune systems. Although the latter may also be considered as an extension of service delivery, it has been separated out as this particular issue requires high levels of collaboration between departments; as such, a more detailed analysis is required.

The achievement of these output indicators is the responsibility of the CWG, representing the CCT's principal institutional intervention to promote and improve ICM within the CCT (CCT, 2014). Thus an analysis of the outcomes is considered an appropriate proxy for gauging ICM within the CCT.

30 2000 was used as the commencement year as this was the same year the CCT as a single and centralized administrative body was established from the merger of 8 sub-councils.

31 Progress is assumed in that there has been a significant increase in input indicators relative to the period prior to the formulation of the CCT as a single administrative unit.

Table 3.1: Input indicators for Integrated Coastal Management

Year	Input Indicator	Function
2001	Formal Adoption of Integrated Metropolitan Environmental Policy.	Set policy directives to promote sustainable development within the CCT, including the recognition of the need to more effectively manage the CCT's coastline.
2003	Formal Adoption of Coastal Zone Management Strategy.	Provide a management framework from which to promote ICM in the CCT.
2004	Development of Sustainable Coastal Management Plans.	Development of SCMPs for each of the CCT's 43 Coastal Management Units*.
2004-2006	Coastal Zone Technical Coordinating Committee established.	Forum used to facilitate collaboration between various line departments at both an operational and strategic level in the management of the CCT's coastline.
2008 – present	Employment of 2 x Senior Professional Officers: Coastal Coordinators	Enhance ICM capacity within the Environmental Resource Management Department and Sport, Recreation and Amenity Department.
2009 - present	Formulation of Strategic Policy Unit	To address high-level policy integration and alignment across line departments and act as a central clearinghouse for policy initiatives.
2008	Sea-level Rise Risk Assessment	Identify risk to the CCT from sea-level rise and storm surges, and appropriate adaptation responses to mitigate these risks.
2009-2010	Coastal Technical Committees established.	District level forums to facilitate collaboration between various line departments at an operational level in the management of the CCT's coastline.
2009-2014	CCT Environmental Agenda	Drive a renewed commitment to sustainability for the CCT, which included a set of specific sectoral targets to be achieved by 2014.
2010	Organizational Assessment	Determine the most appropriate organizational interventions for the CCT to promote increased degrees of ICM.
2012	Coastal Urban Edge adopted in Spatial Development framework	Spatial planning mechanism to promote risk averse decision making along the CCT's coastline.
2013	Departmental Roles and Responsibilities defined for those departments that have an operational impact on the coast.	Clarify roles and responsibilities between the various departments that have impacts on the coast from an operational perspective.
2014 -present	Employment of 2x Professional Officers: Beach Amenity Management	Enhance ICM capacity within the CCT's Sport, Recreation and Amenity Department.
2014	Formal adoption of Integrated Coastal Management Policy	Set policy directives aligned with the Integrated Coastal Management Act as well as the Integrated Development Plan used to guide and inform initiatives to more effectively manage CCT's coastline.
2014	Establishment of Transversal Coastal Working Group	Promote elevated degrees of ICM within the CCT.
2015	Employment of 1 x Professional Officer: Beach Amenity Management	Enhance ICM capacity within the Sport, Recreation and Amenities Department.
2015	Formal Adoption of Coastal Management Programme.	Provide operational guidance to the various CCT line departments to more effectively manage the coast. The Coastal Management Programme provides an update of the Coastal Zone Management Strategy of 2003.

* The identification of these CMBs was based on geophysical and coastal use characteristics i.e. commercial, residential, recreational or rural (CCT, 2003).

3.4.2 Outcome indicators in practice: the case of the Coastal Working Group and the Table View dunes

Is the Coastal Working Group working?

The Coastal Working Group, representative of a second-order governance initiative, was established in December 2014 to address those challenges quintessentially ascribed to bureaucratic forms of organization: to break down departmental silos and to promote integration and synchronization both vertically and laterally within and between departments (SSI & the CSIR, 2010; CCT, 2015c; Laros, 2013). A key deliverable of the CWG is the Risk Register. This register presents a systematic means of reporting on and tracking³² the CWG's progress on resolving coastal issues (CCT, 2015c). Specifically, and as per the Terms of Reference of the CWG, it is the responsibility of the CWG to: 'Instil the Coastal Risk Register within the CCT line departments to record accepted responsibility, rectify within timeframes, close out and monitor a range of issues along the City's coastline' (CCT, 2015c, p. 2).

These issues, or risks, include a wide range of items from coastal ecosystems degradation, broken public amenities such as benches and walkways, damaged coastal signage etc. Table 3.2 presents a quantitative analysis of the progress made by the CWG in resolving the issues listed in the risk register over a period of two years.

Table 3.2: Results of the risk register

Responsible Department	Issues Reported (December 2014)	Issues Resolved (December 2016)	Success
Environmental Resource Management Department (ERMD)	1	0	0%
Solid Waste (SW)	5	0	0%
Sport Recreation and Amenities (SRA)	63	7	10%
Transport For Cape Town (TCT)	40	0	0%
Water and Sanitation	1	0	0%
Overall	110	7	6%

32 This is undertaken by collecting photographic records of coastal issues on a 6 monthly basis, together with logging the GPS location of these issues. This process is repeated every six months to track progress and the results of which are presented back to the CWG.

The results from tracking the Risk Register indicate that, over a two-year period, the CWG has achieved a poor success rate of 6% in resolving coastal issues across the CCT's 240km of coastline. In addition to this figure, and through tracking attendance register records, there has been a steady decline in attendance at the CWG since its inception. Of significance, this decline is more pronounced with senior CWG representatives.

The poor functioning of the CWG is also demonstrated quantitatively, with data suggesting that both the CWG and historical initiatives at establishing collaborative platforms within the CCT have had limited success. Past attempts have included the Coastal Zone Technical Coordinating Committee and the Coastal Technical Committees (see Table 1.1). As noted from a CCT employee that has been a member of each of these past forums and which currently sits on the CWG committee: 'The problem with this [CWG] at the moment, I don't see this going anywhere and I will tell you why. Because initially it [attendance] was the heads of department, now it's their secretaries. In my time in council we have had four attempts at coastal coordinating committees chaired by a Mayoral Committee Member or an Executive Director and it gets down to the extent of, well you [the subordinates nominated to attend on behalf of their superiors] are representing department X now, and they can't speak up [make a decision due to their subordinate position] for that department. This [CWG] is going there already' (Principal Professional Officer, ERMD, 18th September 2015).

Degrading dunes: the case of Table View

Dune systems provide a range of regulatory and provisional ecosystems services³³. In the context of climate change their importance lies in their ability to act as buffers against storm surges and to trap wind-blown sand. Their value in absorbing the impacts of climate change related impacts such as sea-level rise and storm surges is also reflected at a national level as per their prominent mention in the draft South African National Adaptation Strategy (National Department of Environmental Affairs, 2016). Table 3.3 identifies a range of CCT policy documents and programmes outlining the required interventions to maintain and sustain functional dune cordons.

33 These functional systems also provide cultural services in that they contribute to the aesthetic and recreational of value of the CCTs coastline.

Table 3.3: Interventions required as per the various input indicators

Source	Intervention
City of Cape Town Sea-level Rise Risk Assessment (2008)	'Do not further degrade dune cordons: The sand dunes that appear behind a number of CCT beaches provide a natural defence against sea-level rise but are threatened by residents seeking better views of the sea, physical construction on coastal and inland dunes and sand mining' (Cartwright et al., 2008, p.12).
City of Cape Town Coastal Zone Management Strategy (2003)	'To identify, secure and manage appropriate natural coastal areas for the purpose of enhancing and protecting coastal biodiversity and maintaining natural coastal areas for recreation and social purposes' (CCT, 2003, p. 22).
	'Invest in the on-going rehabilitation of degraded dune systems, beaches, estuaries, coastal corridors, rocky shores and coastal wetland systems' (CCT, 2014b, p. 12).
City of Cape Town Integrated Coastal Management Policy (2014)	'Development of coastal economic and social opportunities must be undertaken in a manner that does not reduce, harm or degrade our coastal environment or its ability to cope with climate risks in the future. The diversity and healthy functioning of natural coastal ecosystems and processes must be protected, restored and enhanced for their intrinsic as well as their economic, social and environmental values' (CCT, 2014b, p. 9)
City of Cape Town Integrated Coastal Management Programme (2015)	'Recognize that where systems have been altered to the extent that natural functioning is no longer practical or realistic, implement specific dune management interventions to manage the remaining system in an optimal way as part of an altered system' (CCT, 2015d, p. 2).
City of Cape Town Draft Integrated Coastal Management By-law	'Unless in possession of formal Environmental Approval from the City Manager or his/her delegated authority and, where required, the Competent Authority of the National Environmental Management Act or the Competent Authority of the Marine Living Resources Act, no person shall interfere with, cause damage to, impede or restrict any natural coastal dynamic process(es) within the coastal environment, including but not necessarily limited to: affecting sand dunes in any way' (CCT, 2016b, p. 7)

To achieve the requirements listed in Table 3.3, a strong degree of coordination and collaboration is required between various line departments within the CCT. Table 3.4 provides further detail on who these various departments are, their responsibilities and the processes required on collaborating for the effective management and retention of functional dune systems in Table View.

The integration and synchronization of management interventions presented in Table 3.4 requires advanced planning and constant communication within and between departments for the collective and effective management of dune systems in Table Bay. To determine the effectiveness of the CWG at achieving the requirements listed in Table 3.4, a time series of aerial imagery was used to monitor the state of the dunes in Table View over a period of 17 years (Figure 3.2).

Table 3.4: Roles and responsibilities between CCT departments for dune maintenance

Department	Responsibility	Purpose	Synchronization
SRA	Allocation of budget.	Fund the various interventions, including the appointment of private consultants to undertake technical components of dune rehabilitation.	The success of each of these interventions is dependent upon not only the timing of each department's interventions in relation to each other, but also timing in relation to the season. For example, dune profiling, planting and installation of irrigation systems (undertaken by SRA) cannot take place unless the parking facilities and storm water systems have been repaired and maintained by TCT. Planting of dune vegetation can also only take place over the first period of the wet season (3 months). Budgets also need to be allocated, approved and spent within the CCT's financial year ending in June.
	Profiling of dune cordon and planting vegetation.	Stabilize the dune cordon with vegetation to mitigate against wind-blown sand smothering CCT infrastructure.	
	Installation and maintenance of irrigation systems.	Ensure hydration of planted vegetation as well as keeping sand moist thus reducing its potential to be mobilized by wind.	
	Erection and maintenance of fencing and wooden walkways.	Prevent the public from trampling dune systems.	
ERMD: Biodiversity Branch	Propagating seedlings for planting on dune systems.	Provision of indigenous species to SRA for planting and stabilizing the dune system.	
Transport for Cape Town Department (TCT)	Allocation of budget	Fund the various interventions	
	Maintenance of parking facilities, including the installation of functional storm water systems.	Prevent overflow of rainwater runoff from hard surfaces onto the dune cordon during the winter season and prevent erosion/destabilization of the dune cordon as a consequence.	
ERMD: Coastal Branch	Allocation of budget	Fund advisory role	
	Provide advisory role to both SRA and TCT in terms of dune management best practice.	Promote ICM and by implication retain functional dune systems in the CCT.	

Figure 3.2: Time series reflecting the gradual deterioration of the dune cordon



1998: Densely vegetated dune cordon, well defined beach access paths to beach.



2005: Reduced vegetation cover on the dune cordon, in particular adjacent to the ablution facility. Increased number of informal paths to the beach through the dune.



2015: Significant loss of dune vegetation. Ablution facilities smothered by mobilized sand.

Figure 3.2 presents a visual indication of the deterioration of a section of the Table View dunes. This time series represents only a segment of the entire length of Table View beach (approx. 3km/1.8 miles). Vegetation cover may differ according to season. To eliminate seasonal variation, these images were taken during peak summer months (November to March) throughout the time series. The visual deterioration of the dunes is also supported by a quantitative analysis for the entire Table View Beachfront. From 1998 to 2015 densely vegetated areas (>75%), decreased in surface area by 24%. Sparse vegetation (<25%) and bare sand cover increased by 11% and 16% respectively (Vula Environmental Services, 2016). The deterioration of the dunes are also reflected in the following statements: ‘an assessment of the Table View beachfront found this coastline to have suffered major degradation. Indicative of this situation is a marked increase in bare sand and sparse vegetation at the expense of vegetation with a dense cover (Vula Environmental Services, 2016:2). Further, a site inspection with a dune rehabilitation specialist from the CSIR³⁴ commented on the deteriorating state of the Table View dunes: ‘The Table View Beachfront is a ticking time

34 The CSIR was responsible for the dune rehabilitation for the Table View coastline up until 2000.

bomb. It is a matter of time before the whole dune system collapses due to mismanagement' (pers. comm., 24th April 2015).

The deterioration of the Table View dunes is leading to the generation and distribution of wider coastal risks and mal-adaptive outcomes (Colenbrander, Sutherland, Oelofse, Gold, Tsotsobe, 2012). These risks are beginning to manifest in the socio-economic domain. A recent newspaper article reports on the dangers the degraded beachfront present to the public: '...residents are concerned that deteriorating conditions, including dune erosion, boardwalks submerged by sand, and broken exposed irrigation pipes could put people off as well as being a safety hazard' (Cape Argus, 23 February 2016, p.2). The degraded dunes are also increasingly losing their effectiveness in buffering public infrastructure from surges and instead of reducing wind-blown sand (as originally designed to do), are now exacerbating the issue due to extensive areas of unstable and mobile sand through a loss of vegetation (Vula Environmental Services, 2016). Expenditure on addressing these issues is increasing exponentially and is ultimately being subsidized by the general public. The public toilets are also no longer usable and in other locations along this stretch of coast are home to anti-social behaviour. Risks are also manifesting in the form of reduced aesthetic and cultural appeal detracting from what is a popular recreational and tourist beach.

It is acknowledged that increasing dynamic pressures such as sea-level rise, shifting wind regimes and increasing beach use may be contributing to the deterioration of these dunes and the distribution of wider risks. The question however remains as to why the CCT persists with 'business as usual' and demonstrates lethargy in mobilizing innovative and proactive solutions in preventing dune and beachfront degradation. In this context the deteriorating state of the dune system as an output indicator signals poor performance in ICM by the CWG and the failure to deliver on a key coastal adaptation strategy. We argue that this inertia and non-responsiveness of the governing system and the subsequent production of risks in Table View is largely a consequence of bureaucracy.

3.5 Blockages to Integrated Coastal Management through the lens of bureaucracy

3.5.1 Specialization and the division of labour in discipline and space: disabling the 'I' in ICM?

The CCT institutional assessment undertaken in 2010 identified a well-established silo mentality that was limiting integration between departments (SSI & the CSIR, 2010). More recent research conducted by Desportes, Waddell and Hordijk (2016) indicates that this mentality has shifted towards greater collaboration as demonstrated through the establishment of forums, such as the SPU and the CWG. This was particularly evident in developing climate change adaptation responses (Desportes et al., 2015).

The value of dedicated forums such as the CWG is recognized internationally in that 'The design and establishment of new institutions to deal directly with coastal zone issues in many countries suggest an encouraging trend in the performance of second order governance' (Chuenpagdee et al., 2008, p.16). Chuenpagdee et al. (2008, p. 17) however adds, 'Despite the encouraging trend in second order governance, the overall performance of governance orders in coastal zones remains poor, suggesting low governability'. Similarly, and within the context of South Africa, coastal sustainability remains 'elusive' (Glavovic, 2014).

The authors of this research contend that while there may be increasing collaboration, this is limited to a strategic/policy level occupying the top end of the hierarchy. Instead it seems that silos are becoming increasingly ubiquitous at an operational level. From an ICM perspective this collaboration would appear to be mainly superficial given the poor response to the Risk Register by the CWG as well as the continued deterioration of dune systems in Table View. An authority responsible for operational tasks indicated: 'The silos have never been stronger in Council [CCT] at the moment and they have got increasingly strong since EDs [Executive Directors] have become politically accountable' (Principal Professional Officer, ERMD, 18th September 2015). While the respondent did not elaborate, it is assumed that with increased politicization of the top tiers of the hierarchy there is reduced autonomy at operational levels. This may in turn lead to less initiative to engage and interact with other departments in the resolution of particular issues.

This 'silo' mentality shares strong linkages with research conducted by Froestad et al. (2013) on the organizational dynamics within the CCT. In trying to understand why a particular project requiring departmental collaboration failed to get off the ground, it was identified that the root cause was a consequence of differences in departmental cultures³⁵. It is a well-known phenomenon that the division of labour into departments can lead to the generation of 'silos' (Giddens, 2001). This in turn may amplify differences in departmental cultures (Froestad et al., 2012). A strong and unified organizational culture is considered an important attribute towards effective governance (Rainey & Steinbauer, 1999). Thus the presence of differing cultures within one organization is set to be antagonistic towards good governance.

The geographic characteristics of an organization can also have an influence. Physical proximity encourages collaboration whilst physical distance can establish a polarity resulting in a 'them' and 'us' mentality between departments (Giddens, 2001). Although departmental representatives enter into a shared space of collaboration during CWG meetings, this collaboration is short lived - a single meeting of 4 hours once every month. Thereafter departmental representatives separate in space to their respective offices where they are re-immersed in their departmental mandates and cultures. The 'them' and 'us' mentality is reflected as 'finger pointing' in the following quote taken from email correspondence between an SRA and ERMD official: 'The general state of FH [Fish Hoek] dunes is a result of many factors but chiefly the lack of any attention and management by SRA over many years – a common theme on most of the City's [CCT] dunes' (Principal Professional Officer, ERMD, 19th November, 2015). These two departments, although they are key role players within the ICM competency, are located in geographically separate areas. While there should be an intense collaboration between the two, there is instead a sense of division and an on-going 'blame game'.

The role of geographic distance in generating polarities in the CCT is not limited to a departmental scale, but becomes influential at a broader organizational scale. A post analysis of the merger of the smaller sub-councils to form the CCT revealed that a culture of isolation had formed

35 Organizational culture may be defined as "the patterns of shared meaning in organizations, including shared values and beliefs about appropriate behaviors and actions" (Rainey & Steinbauer, 1999, p.17).

as a consequence of now widely distributed sub-council offices (Celliers et al., 2015). The physical distance between sub-councils as once autonomous ‘close-knit’ municipalities³⁶ under a now centralized ‘mega’ administration is a key challenge for the CCT in achieving effective and equitable service delivery (Deputy Mayor, pers. comm. 23rd November 2015). The performance of the CCT in ICM over an expanded coastline since the merger in 2000 suggests that the current organizational structure is not coping (Celliers et al., 2015). We argue that the expanded area which the CCT is now responsible for is compounding what Head and Alford (2008, quoted in Davison et al., 2015, P. 5) calls an institutional uncertainty where ‘relevant actors are attached to a variety of organizational locations, networks and regulatory regimes, so that processes for reaching decisions concerning wicked problems are likely to be messy and uncoordinated’. The inability of the CCT departments to respond collectively and ‘in sync’ to resolve the dune issues is demonstrative of this institutional uncertainty.

The separation in space and time (in the context of monthly CWG meetings) and consequential departmental myopia is also reinforced by each department having their own dedicated, and separate, budgets. Projects identified on the CWG, as they require collaboration between departments, typically fall into ‘no man’s land’ in respect of budget allocation. ‘These transversal projects that we identify, we still have to beg and plead from this department, that department, for some budget and then he [departmental representative] says that’s not my priority, I am spending my money on something else. So you have all these great projects but there is no money behind them. As soon as there is no money, nothing happens’ (Manager: Environmental Corporate Governance, ERMD, 15th September 2015). The combination of physical distance between departments and separate departmental budgets nourishes a silo culture and ultimately nullifies the intent of the CWG at promoting effective ICM. Instead the CWG fulfils a superficial space of engagement.

3.5.3 Rules and rigidity: prioritizing compliance at the expense of Integrated Coastal Management?

The level of autonomy is inversely related to the number and nature of rules and regulations that are issued by the political principal. An autonomous bureaucracy is issued with less, and more general rules and regulations

36 Departments under sub-councils were generally located within the same building in close proximity to each other.

while a bureaucracy demonstrating limited autonomy tends to be bound by detailed and numerous regulations (Fukuyama, 2013). Similarly, Rainey and Steinbauer (1999) suggest that the relationship between autonomy and good governance is curvilinear. The more supportive and delegative oversight authorities provide, the more autonomy, and leeway, operational level officials have thus improving governance tasks (Rainey & Steinbauer, 1999).

Excessively rule bound bureaucracies tend to be excessively slow moving (Fukuyama, 2013). Whilst excessive regularization may be serving the CCT's financial compliance³⁷ responsibilities well in this regard, it is also having negative consequences: 'we may have reached a tipping point where our levels of compliance are compromising our efficacy [at service delivery]' (CCT, 2015e, P. 10). Merton (1957, cited in Giddens, 2001) argues that the rigidity associated with bureaucracies can lead to a 'bureaucratic ritualism'. Whilst another solution to a particular problem may be better for the organization as a whole, bureaucrats uphold familiar rules and regulations at all costs: In the CCT 'It's all about keeping in line with legal requirements, and nothing to do with solving the problem on the ground' (Manager: Environmental Corporate Governance, ERMD, pers. comm. 14th September 2015). Where rules take precedence over broader organizational goals, the emphasis is placed on procedure, as opposed to innovative problem solving and efficient first order governance (Merton, 1957). Demonstrative of a 'self and organizational awareness' (Desportes & Colenbrander, 2016) report on the phenomena of 'bureaucratic activists' within the ERMD. An oxymoron in terms, some bureaucrats are effectively acting as 'champions', where their efforts are focused towards seeking innovative ways of working around the limitations imposed by bureaucratic structures for purposes of exploring creative solutions to everyday coastal governance challenges. In a bureaucracy this is not without its risks however. In a meeting³⁸ given to 800 CCT authorities of senior rank, the Director: Strategy and Operations commented: 'Because of the command and control culture [within the CCT], this organization has a level of fear within it and sometimes it's almost palpable in the air. We say we

37 The CCT has received 8 clean audits in a row (CCT, 2016c).

38 At the time of concluding this article there was an Organizational Development and Transformation Plan (ODTP) process underway. The intent of which is to examine how the CCT may be restructured to better achieve its service delivery mandate. The purpose of the meeting was to brief senior CCT officials on the reasoning and intent of the ODTP. In recognition of the CCT's poor performance of ICM, the ODTP included the proposal for the creation of a new department dedicated to integrated coastal management.

encourage innovation and we encourage dynamic practices but heaven help you if you actually do that [applause]. Because if you do it, and this is no offence to the noble individuals who work in these departments, but internal audit will be falling over itself to get to your office before forensics does, before someone, possibly me from the Mayor's office, gets to your office' (Director: Strategy and Operations, 22nd January 2016). The incentive to explore creative or more innovative forms of governance is constrained by the rules and regulations set by the bureaucracy.

One of the major weaknesses of bureaucracies is the difficulty that they have in responding to cases that require a deviation from the norm, special cases or in unpredictable work environments (Giddens, 2001). Bureaucracies must be scrutinized when considering that within the CCT, service delivery demands are changing on a daily basis due to a constantly changing socio-economic and political environment (Director, Strategy and Operations, 22nd January 2016). Further contemporary problems such as climate change, the cross-sectoral impacts and responses required for adaptation and mitigation, wicked problems and so forth are all presenting new and dynamic challenges (Moser et al., 2012; DEA, 2016). It is questionable whether conventional bureaucracy, given the evidence in this research and on international literature, is the most appropriate organizational structure to respond to these challenges.

The case of the Table View dunes is no different. The deteriorating state of the dune cordon and ancillary infrastructure³⁹ since the formation of the CCT suggests a new and tailored approach to managing these dune systems is required – the governing system needs to become more responsive to the system to be governed. The CCT in its current organizational format is, however, unresponsive to this first order governance challenge. Management interventions for the Table View dunes remain ad hoc, piecemeal, non-synchronized and reactive without any evidence to suggest a shift towards doing things differently.

A sense of frustration amongst CCT officials surrounding the resolution of the Table View dunes is building. In response to an onsite meeting request initiated by the SRA department to discuss a steps required to solve the problem, an official from the ERMD responded with the following: 'I've declined the meeting due to the fact that I considered yet another site meeting unnecessary. We have

39 Many more meetings have been held prior to the three the respondent refers to. The reference to three is based on meetings called during the term of a new member of staff within SRA.

all already met on-site to discuss the same issue on 3 previous occasions ⁴⁰ (i.e. 29/10/2014, 30/01/2015 and 16/2/2015)' (Senior Environmental Practitioner, ERMD, 4th May 2015). Further, and in reference to the CCT's persistence with business as usual and ultimately failure in managing the dune cordon, 'Departments are throwing good money after bad and repeating the same "solution" year after year' (Manager: Environmental Corporate Governance, ERMD, pers. comm. 18th September 2015).

The comments by officials regarding the management of the dunes are also suggestive of an organization that is failing to apply the iterative governance cycles of learning, adapting and improving management interventions required of a sensitive and dynamic environment. Instead, 'business as usual' remains the hegemonic approach and is supportive of Sankey's argument that bureaucracies tend towards familiar actions over unfamiliar actions with the possibility of learning (Stankey et al., 2003, cited in Fleischman, 2008, p. 12). These comments are also supportive of Davison's et al. (2015, p. 14) findings into the persistent unsustainable outcomes within the CCT, despite policy reforms that focus on reducing substantive uncertainty through a knowledge-based approach. At an operational level it was noted that 'implementation is still dependent on the same unreformed silo structures [in reference to the amalgamation of smaller councils to form the CCT], and has not yet moved to a third-order or double-loop level of learning in which significant paradigm shifts can take place. It is therefore unsurprising that officials have struggled with implementation, despite ongoing policy reforms'. This is of significant concern considering this 'double loop' of learning, or the co- evolution between governing systems and systems to be governed through two-way feedbacks, is a key requisite for effective ICM and climate change adaptation responses (UNEP, 2009; Olsen et al., 2006; Sutinen et al., 2006; Johnson, 1999).

The ERMD has investigated the cost of restoring two major dune systems (Table Bay & Hout Bay) back to their functional state prior to the amalgamation of the various component municipalities into one CCT municipality in 2000. Collectively this amounts to over R35 million (CSIR, 2015; Vula Environmental Services, 2014)⁴¹. We argue that this cost represents a public

40 Many more meetings have been held prior to the three the respondent refers to. The reference to three is based on meetings called during the term of a new member of staff within SRA.

41 This figure excludes the cost of ongoing maintenance required for these dune systems into the future. It also does not include the expense of removing and disposal of this sand over the past 15 years by the CCT or the cost to private residents for removing sand from their properties.

risk (funding will be sourced through the public purse) and is symptomatic of pathology generated by a bureaucracy that is not responsive to the contextual realities of either ICM or the coastal space as an indivisible system.

3.5.4 Disabling autonomy and the production of risks: the influence of hierarchy and the political principal

The scope for innovation and flexibility is nurtured within more autonomous settings and becomes an increasingly important attribute to enable effective first order governance (Fukuyama, 2013). Within the CCT, there is a sense that a strong hierarchical order and top-down communication channels are currently impeding more innovative ways in responding to contemporary challenges at a first order governance level. As Desportes (2014) suggests since the formation of the CCT in 2000, there has been little progress in crossing the vertical divide between the two poles of the hierarchy: that of operational and strategic level staff (Desportes, 2014). The result being a ‘disconnect’ between policy/strategic content and ground level needs (Desportes et al., 2015). Reflective of this challenge to the CCT, the Head: Energy and Climate Change indicated that: ‘We are a bureaucratic organization, it is hard to change things, making it difficult to move into a space of innovation’ (pers. comm., 16 September 2015).

In the ODTP meeting it was noted that: ‘We have to devolve decision making in this organization down to the level of the people who actually deliver services. I think it is completely absurd that someone will be responsible for a R100 million project and make daily decisions on it in a depot somewhere but cannot make a decision of whether their staff member can attend a half day training course somewhere else’ (Director: Strategy and Operations, 22nd January 2016). This particular statement given by the Director: Strategy and Operations, was followed by applause, signifying widespread agreement in the lack of autonomy within the CCT. The rigidity imposed by bureaucracy, in specific relation to a strong hierarchical chain of command, is disempowering to staff required to solve problems on the ground.

The case of the Table View dunes offers a lens on the link between bureaucracy and autonomy and how the relationship between the two can impede ICM and instead generate coastal risks. Indeed, the problematic of a lack of autonomy at an operational level is amplified given that the hierarchical organizational structure detaches the top tier officials from the challenges being experienced on the ground. While the state of the Table View dunes

has been deteriorating since the amalgamation of the CCT in 2000, a recent presentation on the state of the dune system and adjacent infrastructure given to high-level authorities (strategic: director and executive director level) revealed that they were not aware of the dilapidated state (CCT, 2015f). The disconnect between strategic and operational level staff is similarly voiced by the Manager: Environmental Corporate Governance, ERMD: 'High level staff are not familiar with what is happening on the ground' (pers. comm., 18 May 2015). Burns and Stalker (1966) equate this to an organization that is perfunctory and is not responsive to the required two-way communication channels between the 'people at the top' and those 'at the bottom'.

The CCT's positive performance in developing input indicators (see Table 3.1) while failing to restore the Table View dunes as an output indicator is demonstrative of this 'disconnect': 'Part of the challenge is that if you have a look at this structure [hierarchy], I'm a designated manager, I can't tell the director what to do because the authority is not right. So you also land up in these structures where we have no high level person to say we are doing this [making decisions and giving direction], they are not going to listen to me' (Manager: Environmental Corporate Governance, ERMD, pers. comm., 14th September 2015). Further, the discretion of lower level bureaucrats is being limited by the political principal. In discussing a particular operational challenge⁴² within the CWG, one of the members stated: 'it is important for this committee [CWG] to not run scared at the first encounter of political resistance [in response to our decisions], such as the case of Lukannon Drive. Politics is one amongst a range of informants and hence it cannot become a determining factor, if there are other compelling reasons for a specific way forward' (CCT, 2015g). Political interests however won the day over a solution (see details of solution in footnote 30) proposed and supported by the broader CWG committee. Reflective of a top-down political principal-agent framework, Fukuyama (2013) argues that limiting autonomy at an operational level is inadequate as it assumes the agent is merely a tool. Effective bureaucracies instead demonstrate a reverse flow of authority from the agent to the political principal, where the agent provides feedback to, and shapes strategic level decisions by the political principal, which in turn creates an enabling environment for the agent to resolve governance challenges (Fukuyama, 2013).

42 The dilemma was whether to continue (at significant and escalating cost and resources to the CCT) to remove large quantities of wind-blown sand from a coastal road in a poor community. Ultimately the decision was a political one to keep the road open no matter the expense and viability thereby perpetuating financial risks to the CCT and its ratepayers.

3.6 Conclusion: the value of informal networks

There is global recognition of the need to adopt a more integrative, multidisciplinary and systems oriented approach in responding to coastal risks posed by climate change (Carter et al., 2015; O'Brien & Selboe, 2015). While the CCT is aware of this, evidenced through the establishment of transversal working groups such as the CWG and policy adoption that attempts to institutionalize ICM, the structural tenets of bureaucracy continue to nullify these efforts. The persistence of poor levels of departmental collaboration, limited autonomy and an inability to learn and adapt at an institutional scale are demonstrative of this. These organizational failings are in turn filtering down to the system to be governed, whereby the symptoms of these failings are manifesting as a deteriorating coastal environment and mal-adaptive impacts.

The CCT's bureaucracy, that of separate departments (in location and discipline), a top-down hierarchy of communication flows (see Figure 1.5) and an intensely regulatory and compliance orientated environment, is preventing the required governance shifts to respond to new and dynamic pressures. Instead there is a self-perpetuated generation of risks that are being distributed to the wider socio-economic domain. We refer to this as the pathology of coastal risk production. This also draws strong parallels with Beck's concept of a risk society, that although the CCT is tasked with managing and mitigating coastal risks, its own bureaucratic structures are instead playing a significant role in generating them. In the face of climate change, this is replicating as mal-adaptation. The non-responsiveness of the CCT to the challenges presented at Table Bay confirms the mismatch between the governing system and the system to be governed. While there is a wealth of research on structural reforms away from traditional forms of bureaucratic organization, there is very little literature on how to 'work around' existing bureaucracies that are entrenched in an organization. This research has shown that while second order governance structures, such as the CWG, have been put in place to address the deficits of bureaucracy, the bureaupathology persists and is undermining the CCT's attempts at institutionalizing ICM through the CWG. The query of how to work with and improve existing bureaucratic forms of organization is an important topic given the universal orthodoxy instilled in bureaucracies and the increasing responsibility bestowed on government agencies in responding to climate change pressures.

As a means to address the limitations of bureaucracy and to better match or generate an 'isomorphism' between the GS and the SG, some scribes advocate the development of informal networks (Pelling, 2010; Giddens, 2001). These networks may be developed between colleagues within a particular department, between departments within an organization, or more broadly across multiple actors across a broader governance landscape. Joshi and Hautzager (2012) submits that informal institutions and their networks are set to play a greater role in climate change adaptation. Glavovic (2013, p. 926) offers '...networked governance opens up intriguing possibilities for coastal sustainability'. The value of networks, through fostering personal relationships, are attributed to their ability to transcend bureaucratic structures and create spaces for political suasion (Giddens, 2001; Simon & Leck, 2014). We suggest that this suasion could be critical for not only enabling a 'reverse-flow', albeit informal, between the agent and the political principal (see Figures 1.2 & 1.5), but that such a shift would generate a more flexible and responsive governing system. The political principal, after all, plays an important role in allocating resources and setting appropriate policy goals in responding to climate change pressures (Pasquini et al., 2015). The value of these informal networks and the inertia that bureaucracy presents is perhaps best summarized by a statement given by a strategic level CCT official (anonymous) who surmised: 'You have to work outside the system as the system does not work for you'. On this basis, and from a coastal governance and adaptation perspective, we suggest that further research into the value of informal networks as a potential enabler for improved degrees of ICM and climate change adaptation be tested and developed. The caveat is the ability to develop and harness networks of informality without simultaneously creating spaces that may in themselves undermine the noble intent of bureaucracies, that of the 'institutionalization of legal rational authority towards democracy and good governance', in the context of a developing nation state.

Chapter 4:

Drawing a line in the sand: managing coastal risks

This chapter is a minor revision of the article:

Colenbrander, D. R., Cartwright, A., & Taylor, A. (2015). Drawing a line in the sand: managing coastal risks in the City Of Cape Town. *South African Geographical Journal*, 97(1), 1-17.

4.1 Introduction: drawing a line in the sand? Not so simple

Cape Town is internationally renowned for its beaches and coastal beauty. The 240 km of South Africa's coastline under the jurisdiction of the CCT is valued for its contribution to recreation and tourism, its ecological diversity and endemism, as a buffer against flooding, as prime real estate and as a source of livelihoods associated with fishing, sand mining and water sports. The extensive coastline also exposes the city to the risks associated with storm surges and sea-level rise. The 'Cape of Storms'⁴³ has always been an energetic and dynamic place, but anthropogenic climate change, in conjunction with rapid and extensive coastal development, has created additional risks that require new responses. Coastal Management Lines (CML) that demarcate land on which the development of new buildings and infrastructure is prohibited or prescribed, represent one of the nationally and internationally promoted responses to sea-level rise (Schwartz, 2005; DEAT, 2008; Sano et al., 2008). This paper documents the effort to establish a CML for the CCT in terms of the requirements of the Integrated Coastal Management Act (ICMA) (Act 24 of 2008) and shows that, far from being a matter of cartography and decree, the process of rendering a CML effective can be protracted and contested. This finding is supported through an additional case in the Overberg District Municipality. The Overberg District Municipality (ODM) forms the eastern neighbour to the CCT. With a coastline of approximately 304 km in length, the ODM comprises four local municipalities, namely the Cape Agulhas, Overstrand, Swellendam and Theewaterskloof Municipalities. The findings from these two case studies builds on the work of McKenna, Cooper, and O'Hagan (2008), who highlighted potential contradictions in the principles espoused under the European Recommendation on Integrated Coastal Zone Management (ICZM). In this paper, the process through which local officials come to interpret and apply principles of 'best practice' in coastal management is highlighted instead as a source of contradiction and conflict.

The paper suggests that the influence of different mentalities, technologies and resources in terms of nodal governance theory leads to different interpretations of 'best practice' at the local level. This is particularly true in places such as Cape Town that are defined by political contest and socio-economic inequality. However, the study suggests that these differences can also be evident within municipal government, and indeed within a single directorate of municipal government. There is a parallel between differing

43 This was the name given to Cape Town's coastline by early seafarers.

mentalities, technologies and resources and the governance challenges this may generate with the challenges presented by poor 'goodness of fit' between governance elements as per IG theory. Here images set in terms of IG may also reflect governance mentalities, instruments may represent technologies, and actions as resources. Although this chapter uses terms associated with nodal governance theory, these terms carry the same meaning as per those used to describe governance elements as per IG theory. This chapter therefore responds to sub-question iii as presented in section 1.4 of Chapter One, namely: 'How does the relationship between governance elements enable or disable local government in achieving its goals, specifically as it relates to the implementation of coastal adaptation strategies'

The data and supporting information that underpin the findings presented in this paper were gathered from interviews and focus groups with residents, business representatives, political leaders and government officials in Cape Town and the Overberg District Municipality. Participant observation during numerous CML meetings and a review of relevant government documents and academic literature was also undertaken. As such, the paper reports on the process as experienced and recounted by local government officials in the midst of the process, as opposed to a third party post-hoc analysis. In doing this, it describes many of the details of the local planning and policy process that are often omitted from the documented record, thereby leaving the false perception that such processes are straightforward 'if only best practice is applied'.

4.2 Coastal risk in Cape Town

Over the twentieth century, global mean sea level rose by 0.17 m (0.12 m – 0.22 m) (IPCC, 2007). The rate of this rise, however, accelerated towards the end of the century, such that the mean annual rate of increase between 1993 and 2010 was almost double the mean annual rate between 1901 and 2010 (IPCC, 2013). The Intergovernmental Panel on Climate Change's (IPCC) Fifth Assessment Report (2013) posits an upper boundary of 0.82 m for global mean sea-level rise by 2100. The most recent IPCC forecast represents a significant increase relative to the Fourth Assessment Report forecast of 0.59 m, but remains primarily dependent on the anticipated thermal expansion of the ocean. It does not include the possibility of nonlinear changes in the extent of major terrestrial ice-sheets or more frequent and intense storms, for which there is a growing body of global evidence. Epstein and Mills (2005) drew attention to the fact that polar ice is melting at rates unforeseen in the

1990s, and that as melt water lubricates the movement of glaciers, some of these glaciers (in Greenland) are moving 14 km per year, twice as fast as in 2001. Hanna et al. (2005) calculated a total loss of Antarctic ice in the period 1995 – 2005 which was double of that in the previous decade. Velicogna and Wahr (2006) determined that the West Antarctic ice sheet had lost $152 \pm 80 \text{ km}^3$ of ice per year between 2002 and 2005, a rate several times greater than that assumed in the IPCC Third Assessment and a loss that on its own contributed 0.4 mm ($\pm 0.2 \text{ mm}$) to mean annual sea-level rise. Tol et al., (2008) estimated that a collapse of the West Antarctic Ice Sheet would raise average sea-level by approximately 5 – 6 m. The dynamics that govern ice-sheet fragmentation and melt remain innately difficult to model and project, but collectively the efforts to better understand these dynamics suggest that mean sea level may be increasing at accelerating rates (Jevrejeva et al., 2006; Jevrejeva et al., 2008; Church & White, 2011).

For the CCT, sea-level rise presents a current threat, damaging infrastructure and exposing bad spatial planning decisions, especially during periods of storm surge. South African estimates of sea-level rise have relied on tide gauges, not the more accurate satellite imagery, but Searson and Brundrit (1995) analysed readings at the naval base in Simon's Town (near Cape Town) to suggest that sea levels in that region were rising at 2 cm per decade – similar to the estimated rates of global sea-level rise at the time. Mather (2008) drew on a wide set of gauge readings to report that sea levels along South Africa's south western and southern Cape coast were rising at 1.57mm per annum. Aware of the trend, and prompted by a particularly damaging storm surge event in South Africa's other major coastal city, Durban, in 2007, the CCT's Coastal Management Branch (CMB) commissioned a study in 2008 to quantify the resultant risks and to review adaptation options that might reduce this risk (Cartwright, 2008; CCT, 2012a). The study modelled the risks based on three different scenarios for the year 2030. The scenarios, described below, aimed to capture the combined effect of sea-level rise, tidal flux and storm surge:

- Land Levelling Datum (LLD) 2 m in sheltered environments – which is already typical of large stretches of Cape Town's coastline as a result of tidal flux and local weather patterns.
- LLD Datum 4.5 m above mean sea level – which is already experienced in stretches of the coastline that are highly exposed to storm surge.
- LLD Datum 6.5 m above the mean sea level – which was based on very high levels of mean sea-level rise in stretches of coastline exposed to storm surge.

Using GIS software, the land areas affected by the three scenarios were placed into maps of Cape Town's coastline that included coastal topography and significant public infrastructure such as roads, electricity sub-stations and buildings (see Figure 4.1 which reflects the different inundation levels as different colours for a particular segment of coastline).

Figure 4.1: Sea-level rise flood risk scenarios for the Cape Town over the next 25 years



(Source: Brundrit, 2008)

The maps enabled CCT planners to gain a better understanding of specific infrastructure at risk of the respective events. The maps also enabled an estimation of 'threatened value' (Cartwright, 2008) by indicating the affected real estate, impacted infrastructure and an estimate of tourism sector loss under the three scenarios. By attaching the probability of occurrence in a 25-year window to the estimate of 'threatened value', the cost of sea-level rise risk to the CCT over the ensuing 25 years was calculated (Table 4.1).

Table 4.1: Probability and cost of sea-level rise risk over the next 25 years

25 years	Inundation level 1	Inundation level 2	Inundation level 3
Sea level (m)	2.5 (Blue)	4.5 (Yellow)	6.5 (Red)
Probability in next 25 years	95%	80%	20%
Threatened value	R5.2 billion (US\$500 million)	R23.8 billion (US\$2.3 billion)	R54.8 billion (US\$5.4 billion)
Value at risk (= threatened value x probability)	R4.9 billion (US\$490 million)	R20.2 billion (US\$2 billion)	R11.0 billion (US\$1.1 billion)

(Source: Cartwright, 2008)

Figure 4.2: Milnerton golf club house during a storm surge in 2008



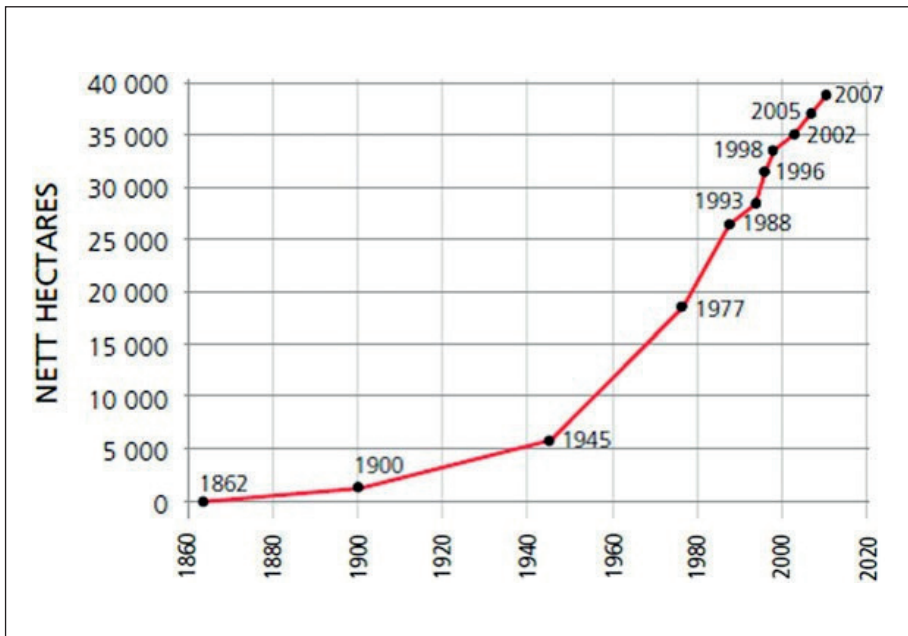
(Source: author)

Risk was found to be a useful concept for communicating the many and varied ways in which sea-level rise impacts on different aspects of society, the economy and the environment. Most people who were consulted in the course of the process had an intuitive understanding that sea-level rise and storm surge had the ability to impose undesirable impacts, even if the origins of those impacts and the complex social-ecological pathways through which they manifest were not always appreciated. Similarly, reflecting the risk of storm surge as an economic cost proved effective in capturing the attention of the business and political leaders (Cartwright, 2008). Once the risks had

been communicated, the focus shifted rapidly towards appropriate adaptation responses to the coastal pressures (CCT, 2012a). This focus highlighted the impact of historical spatial planning decisions in placing infrastructure and people at risk along the city's coastline (Figure 4.2).

The rate of residential and commercial development in Cape Town doubled between 1980 and 2007 (Figure 4.3) and much of this development took place on prime real estate adjacent to the coast. Locating infrastructure in close proximity to the high-water mark, and in some cases on reclaimed land, has compounded sea-level rise risk. The assumption when granting these coastal development rights was that future sea levels would resemble the recent past and that engineering solutions would protect development from the innate variability of the coastal zone. It was this assumption that underpinned the reclamation of land at Cape Town's foreshore and at Sea Point and which legitimized the mining of sand dunes and the in-filling of coastal wetlands that had previously served as coastal buffers. A range of international case studies reveal similar assumptions with regards to planning for coastal development elsewhere (Carvalho & Coelho, 1998; Corrina et al., 2002, cited in Cooper & McKenna, 2008).

Figure 4.3: Cape Town's spatial growth from 1860 to 2007 (Source: CCT, 2012c)



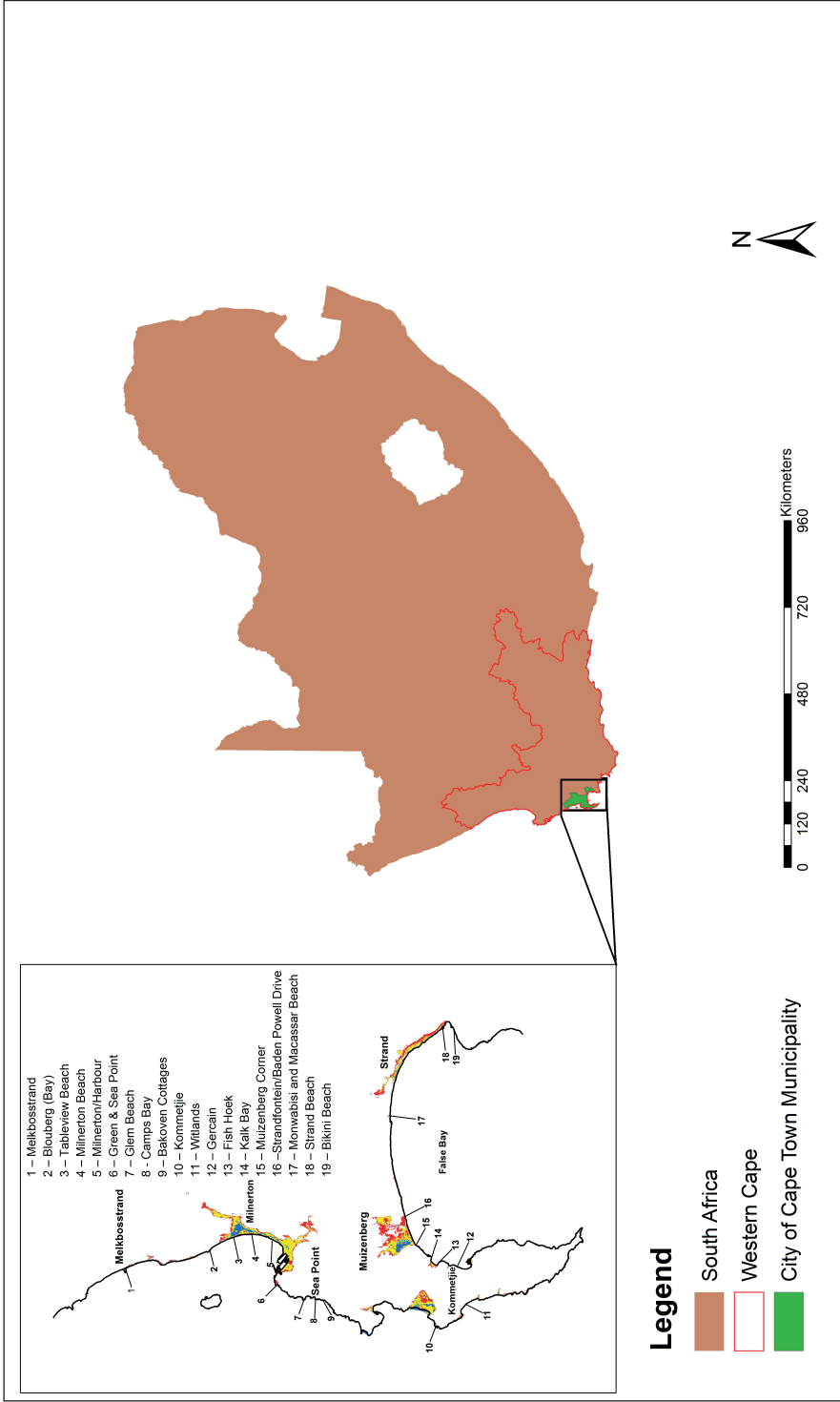
The realization that historical decision-making and spatial planning had compounded sea-level rise risk enabled the CMB to begin a process of revising the criteria by which applications for coastal development rights and activities are assessed (CCT, 2012c). The promulgation of the ICMA at the national level during this same period and the specific ICMA requirement that municipalities develop mechanisms to promote risk-averse decision-making lent further impetus for the establishment of the CCT's coastal planning efforts (CCT, 2012d).

4.3 Promoting risk averse decision making

Coastal management lines are advocated in the international literature as a means of managing complex coastal risks under conditions of uncertainty (Schwartz, 2005). The notion of a buffer zone, within which development is prohibited or highly prescribed and coastal ecosystems are restored and protected, aligns with the 'precautionary principle' to economic development in the face of uncertainty (UNEP, 1992) and with socio- institutional approaches to adaptation (Downing & Dyszynski, 2010) and principles of adaptive management (Sano et al., 2008). It also introduces the important features of 'flexibility' and 'reversibility' (Hallegatte, 2008), both of which are considered valuable in the context of rapidly evolving urban systems and dynamic coastal zones (Mather, 2011).

In South Africa, CMLs have become a legal requirement in terms of the ICMA. The ICMA speaks about the need to retain the coast as a shared and common asset, to retain the aesthetic and heritage value of the coast and to protect coastal biodiversity. Personnel in the CCT's CMB were drawn to the idea of CMLs as a way around the limitations and costs associated with alternative coastal risk management approaches such as sea walls (that in many instances had either exacerbated coastal erosion or collapsed), beach replenishment efforts (that have proven costly to administer) and the constant repair of road, rail and bulk water reticulation infrastructure. The emphasis within the CMB was not on a managed retreat of existing private infrastructure developed on the seaward side of the line – in the Cape Town context this was deemed too ambitious and potentially costly in terms of restitution – but rather as a way of limiting the CMB's responsibility for repeatedly damaged public infrastructure within these risk areas (Figure 4.4) and as a way of preventing future developments that would compromise effective coastal management (CCT, 2012a). There is a documented frustration within the CMB over the perceived under-acknowledgement of coastal risks in the

Figure 4.4: Vulnerable locations along Cape Town's coastline



awarding of development rights and the subsequent transfer of risk from property developers to home-owners and back to the CCT when home-owners either demand protection from the CCT or construct piece-meal and (mostly) ineffective sea-defences that fail to protect their properties and redirect wave energy and impacts to adjacent properties (Figures 4.5) (Colenbrander et al., 2012).

Figure 4.5: An example of how failed private interventions to protect property lead to a loss in the recreational, aesthetic and the tourism potential of beaches and the subsequent transfer of risk to the broader public



(Source H. Gold)

4.4 Whose line is it anyway?

Emboldened by the results from the local risk assessment, rising international awareness of sea-level rise risks (Hansen, 2007; Kemp et al., 2011; Rahmstorf, 2012) and perceived support from national legislation through the promulgation of the ICMA, the CCT's CMB set about developing the rules and regulations applicable to a CML. Although the demarcation of

areas exposed to coastal hazards was an important first step in helping CCT officials understand the spatial variability of this risk, the delineation of a CML called for more detailed planning and further disaggregation of risk⁴⁴ at a site-specific scale. This was undertaken through a determination of the influence of wave climate (such as wave set-up, wave run-up and wave shoaling), bathymetry and swell diffraction (Brundrit, 2009). This study not only enabled the CCT to refine the positioning of the CML in relation to these hazards, but yielded 19 locations (Figure 4.4) that were considered particularly vulnerable to the impacts of sea-level rise and storm surges and provided further opportunities for consultation.

From the perspective of the CMB, establishing a CML should have been a straightforward application of national law and internationally recognized 'best practice'. As it transpired, however, the process of local application proved more complex and contested than the CMB had anticipated. It required additional research, as well as formal and informal engagement with stakeholders in and outside of local government, in a process that was financially supported by the International Development Research Centre (IDRC).

The CCT's informal⁴⁵ stakeholder engagement process was undertaken between 2008 and 2011 and included presentations by CMB officials to ratepayer associations and other interest groups across Cape Town that focused on:

- Identifying pressures along the city's coastline from both biophysical processes (e.g. storm swell and wind-blown sand transport) and urban development practices;
- Identifying the impacts of these pressures and understanding how impacts are experienced by local residents and beach-goers;
- Explaining the legal mandate of the CCT to establish coastal regulatory mechanisms, especially CMLs, as per the requirements of ICMA;

44 While risk from sea-level rise and storm surges was a key informant in determining the position of the CCT's CML, there were a range of additional informants beyond risk to sea-level rise and storm surges. These included the presence of dynamic coastal processes such as shifting dune systems and migrating estuary mouths, socio-economic elements such as promoting access to the coast through nodal development, legal implications for properties with existing development rights, biodiversity informants, aesthetics, etc. (CCT, 2012b).

45 The term 'informal' is used as these stakeholder engagement sessions were not part of the CCT's formal public participation processes to which there are a set of CCT approved standards and conditions that conform to the requirements of the Constitution of South Africa.

- Proposing key principles (and gauging public ‘buy in’ to these principles) in the delineation of a CML, and
- Obtaining feedback from stakeholders and members of the public as a basis for drafting a formal methodology for delineating the CCT’s CML (CCT,2012a).

Based on the outcomes of these information sharing sessions, the CMB went about demarcating a CML on maps of the CCT’s coastline. The proposed line attempted to reflect the perceptions and preferences that had been shared in the consultation process, and in this way went beyond the conventional approach to establishing CMLs both internationally and in South Africa, that is empirically generated, based on biophysical models, and often blind to social and economic considerations (McKenna et al., 2008).

In order to ensure that the proposed CML was enforceable by the CCT, the CMB drafted a by-law. Section 156(2) of South Africa’s Constitution ‘... provides that a municipality may make and administer by-laws for the effective administration of the matters which it has a right to administer, and to exercise any power concerning a matter reasonably necessary for, or incidental to, the effective performance of its functions’ (CCT,2009c, p.1).⁴⁶ The pursuit of a by-law was deemed necessary to enable legal proceedings against illegal land use and activities along the coast.

The CCT’s by-law promulgation process required a formal public participation process. This was duly conducted in 2011 and yielded a 97% approval for the proposed CML (CCT, 2009d).⁴⁷ The opposition that was received, however, was vehement. Demand for coastal property remains high and coastal real estate represents an important commercial opportunity for property developers and an important source of rates for the CCT. Representatives from the affected economic sectors and constituencies expressed dismay at what was perceived to be the curtailing of an economic and job-creation opportunity. At times, this resistance was framed in the context of Cape Town’s (and South Africa’s)

46 While the ICMA makes provision for municipalities to develop by-laws, by-laws can only be established in terms of the ICMA once Municipal Coastal Management Programmes have been formalized. At the stage of delineating the CML, the CCT did not have a Municipal Coastal Management Programme in place. Considering the urgency and priority of establishing a CML, a by-law was established in terms of the Constitution.

47 This percentage was determined based on the number of respondents in support of the by-law and the CML in relation to the number of respondents who were not in support of the by-law and CML.

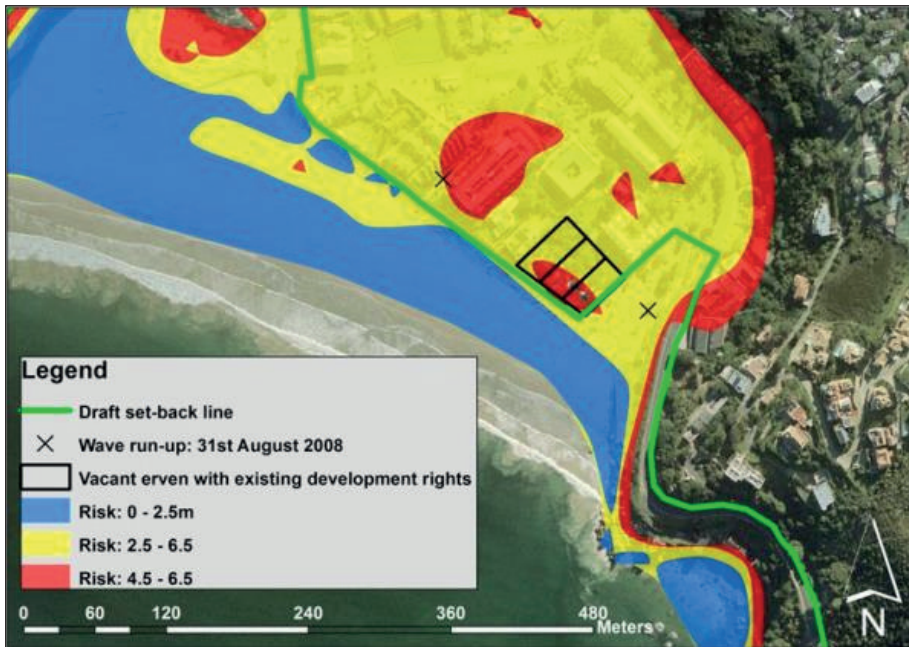
particular history. Apartheid legislation was explicit in its efforts to exclude certain race groups from the best coastal amenities and prevented the owning of Cape Town's coastal property by people classified as 'Black', 'Coloured' and 'Indian'. The same apartheid legislation saw many people classified as 'White' benefit greatly from rising values for coastal real estate, to which they had exclusive access. Understandably, then, the CMB's efforts to prescribe or restrict access to the coastal zone – albeit for environmentally prudent reasons and based on an assessment of the public risk and benefits – evoked apartheid memories and encountered resistance in certain communities. As Leck et al. (2011, p. 7) observe, the injustice of South Africa's apartheid past 'Remains firmly entrenched in cultural memories and presents a possible formidable barrier to climate change adaptation, as poor and marginalized people often consider environmental protection to be about conserving nature for the privileged few'.

Given South Africa's particular history, a unanimous response to the proposed CML was perhaps improbable. The level of support that was forthcoming bore testimony to the extent of communication and awareness raising that preceded the proposed by-law. What had not been anticipated was the subsequent resistance from other units within the CCT, some of them operating within the same directorate as the CMB. The Planning and Building Development Management Department (PBDM) in the CCT, in particular, took umbrage with the CMLs prescription of land use and property development procedures. The PBDM was not unsympathetic to the issue of sea-level rise risk, but saw the CMB's approach to managing it as an encroachment on its mandate to administer land use rights as described in the Cape Town Spatial Development Framework (CT:SDF). The PBDM raised further concerns that the proposed CML and supporting by-law was poorly aligned to existing guidelines for altering land use rights (including rezoning, subdivision, reinstatement of lapsed rights and extension of the period of rights) on public and private land, and that it might undermine the ability to administer their responsibilities. To strengthen their case, members of the PBDM cited a reluctance to make the property development approval processes any more complicated or to run the risk of devaluing private property. This is a particularly powerful argument in Cape Town given the perceived need for investment and economic growth, and the obdurate nature of the housing backlog.⁴⁸ The PBDM position was given further credence by the process in the

48 In 2009, the CCT had a backlog of approximately 330,000 housing units. Today, the CCT requires an annual growth of 25,000 units per annum to prevent the backlog increasing. As a consequence of this backlog, demand is outstripping supply resulting in the growth of informal settlements by 13% per annum (CCT, 2009c).

adjacent Overberg District Municipality where coastal property owners initiated legal challenge against the municipality for impinging on their rights with the attempted demarcation of a CML (SSI, 2012).

Figure 4.6: Erven at risk but with development rights, Hout Bay. As these erven have existing development rights they were excluded from the City of Cape Town's Coastal Management Line. Sites such as these will require additional land use management mechanisms to address risk to these properties into the future.



(Source: CCT, 2012a)

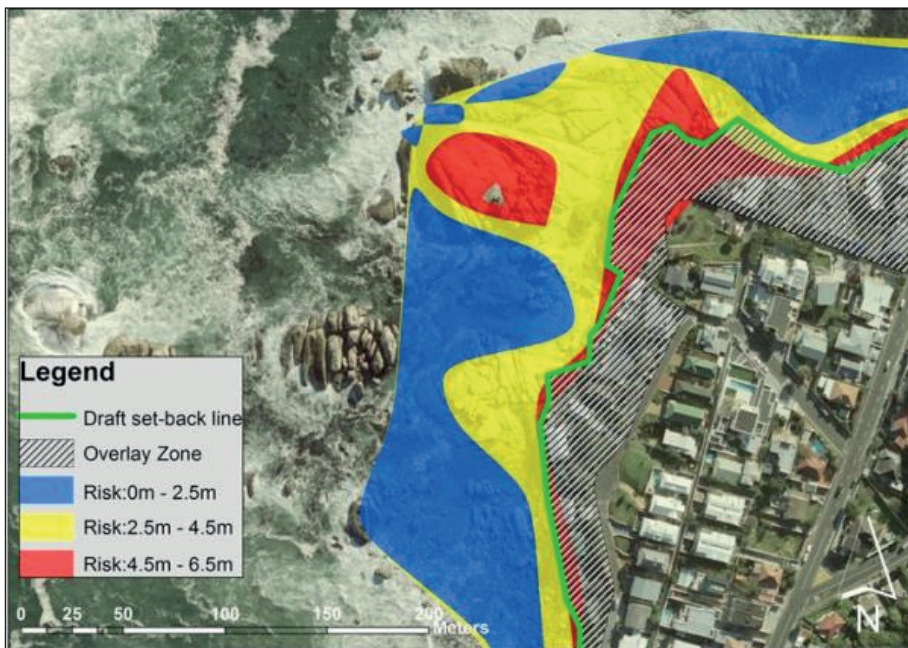
The CMB had learnt from the Overberg District Municipality process and deliberately excluded private properties with existing development rights⁴⁹ when mapping the Cape Town CML (Figure 4.6). In spite of this, the PDBM's concerns led to the CCT's CML by-law being rejected by the CCT's Economic, Environmental and Spatial Planning Portfolio Committee⁵⁰ in late 2011. The committee instructed the by-law to be revised to focus exclusively on the

⁴⁹ This approach was only applied in areas of the coast where there were properties with development rights – typically in developed/highly altered stretches of the coastline. In less-developed areas (with no development rights), the CML skirted further inland based on a range of additional informants.

⁵⁰ This is a high level decision-making forum with political representation.

regulation of coastal activities,⁵¹ as opposed to the regulation of land use. The required revision was interpreted as a defeat of the idea of a CML and did little to allay the CMB's concerns with regards to sea-level rise and storm surge risk.

Figure 4.7: Stylized representation indicating the position of the Coastal Management Line. The area between the CML (green line) and the sea is where the by-law will apply, and properties landward of the CML is where the Coastal Overlay Zone will be applied in terms of the CCT's new Integrated Zoning Scheme. Overlay zones are considered more appropriate mechanisms to manage existing property at risk and will apply special land use and building regulations to these areas.



(Source CCT, 2012a)

In order to meet their responsibility to reduce sea-level rise risk while accommodating the concerns raised by PBDM, the CMB began exploring the use of an 'overlay zone' to manage those properties at risk on the landward side of the CML (CCT, 2012a). An overlay zone denotes an area within which

51 Examples of activities include encroachment of private property into public open space (where public open space is already spatially defined in the CCT's cadastral maps), installation of illegal private structures within public open space, indiscriminate access to the coast, etc.

additional site-specific conditions can be attached to proposed and existing developments (Figure 4.7). The CCT's proposed coastal overlay zone will enable PBDM and the CMB to review and control the expansion or upgrading of existing infrastructure based on the site-specific risks. In practical terms, the overlay zone will focus on developing and applying building codes that reduce the risk of a range of coastal hazards to existing properties and will ensure that the development of any protective measures (such as sea defence mechanisms) are informed by CCT determined principles⁵² and that such measures minimize the scope for mal-adaptation in the form of sea-level rise adaptation measures that unwittingly make the problem worse. Crucially, the use of an overlay zone has been met with the approval of both PBDM and CMB.

In the process of developing the idea of a coastal overlay zone, the CMB and PBDM found a pragmatic and innovative way of also applying the original CML. The line was presented as the 'Coastal Urban Edge', the seaward equivalent to the CCT's Urban Edge. The Urban Edge is a concept that is central to the CT:SDF and has guided many of the activities of the PBDM and the CCT's Spatial Planning and Urban Design Department. The Urban Edge demarcates the outer limits of urban development for a determined period of time in the medium- to long term as a basis for phasing urban growth, limiting rapid sprawl, promoting densification and protecting natural resources. Adopting this concept, the draft CML was formalized as the Coastal Urban Edge and was approved as such with the revision of the CT: SDF in May 2012. As the Coastal Urban Edge, the CML now constitutes an important tool in PBDM's efforts to strike an appropriate balance between meeting urban development priorities and limiting sea-level rise risk.

The inter-disciplinary contestation and collaboration between PBDM and CMB that emerged from efforts to reduce sea-level rise risk is a relatively new feature of the CCT's spatial planning and management, and it equips the CCT with the type of institutional capacity required to deal with the cross-cutting challenges of climate change and the reconciliation of biophysical and socio-economic objectives in the CT:SDF (Table 4.2). The eventual collaboration between units within the CCT was not, however, the end of opposition to the CMB's CML. The ICMA places the responsibility of defining and formalizing CMLs with the

52 These principles will be determined in accordance with both the National and Provincial spheres of government and will include aspects such as heritage considerations of a particular area, design specifications for sea defence mechanisms, the need to consider aesthetic impacts, the avoidance of encroachment into public open space, etc.

Provincial authorities so as to ensure a level of consistency across municipalities (DEAT, 2008. p. 25).

Table 4.2: Policy statements contained in the Spatial Development Framework that relate to coastal management lines

Strategy	Sub-strategy	Policy No.	Policy statement
Plan for employment, and create access to economic opportunities	Promote inclusive, shared economic growth and development	1	Maintain and enhance the features of Cape Town that attract investors, visitors and skilled labour.
Manage urban growth, and create a balance between urban development and environmental protection	Encourage a more compact form of urban development.	23	Contain the development footprint of the city, and protect natural, urban and heritage assets with development edges.
	Appropriately manage urban development impacts on natural resources and critical biodiversity networks	27	Manage urban development along the coast in a sustainable and precautionary manner.
Build an inclusive, integrated and vibrant City	Transform the apartheid city	35	Redress existing imbalances in the distribution of different types of residential development, and avoid creating new imbalances.
	Enhance the value of heritage resources and scenic routes	48	Carefully manage land uses and interventions along identified scenic routes, and in places of scenic and visual quality.
	Promote accessible, city-wide destination places.	50	Develop high quality accessible destinations in public spaces in newly developed and neglected areas.

(Source CCT, 2009a)

In 2009, the Western Cape Province acting on its mandate under ICMA appointed external service providers to develop a CML in the Overberg District Municipality as the first ‘test case’ of what the Province hoped would become the provincial methodology. The demarcation of a CML for the Overberg District Municipality was based primarily on sea-level rise and wave run-up models, as well as maps of coastal topography, undertaken through a remote desktop analysis (Pasquini, 2011).

As a consequence of the CCT’s CMB initiating its CML demarcation through a very different process, the respective approaches adopted in Cape Town and the Overberg District Municipality differed significantly, with the key difference being the accommodation of existing properties and development rights in the CCT’s process as a pragmatic concession to land owners which

was augmented by the application of an overlay zone. The method applied in the Overberg District Municipality did not engage pre-existing social and institutional considerations to the same extent as the CCT. The lack of alignment between the methodologies initially raised concerns amongst provincial and national officials, who felt the CMB might be acting outside of its ICMA mandate and running ahead of the provincial process. Fortunately, after consultation, the pragmatism of the CCT's approach subsequently won support within the Province, leading to its adoption throughout. The Province's position in this regard was influenced by the threat of litigation in the Overberg District Municipality, where property owners felt their development rights were being curtailed without consultation. It remains to be seen whether the Western Cape Province's adopted process will meet with the approval of National Government and its interpretation of the ICMA requirement. However the case for respecting local planning instruments, and for these instruments remaining pragmatic, now exists.

4. 5 Extracting lessons

A superficial analysis would suggest that, when confronted with sea-level rise risk, the CCT's CMB took recourse in a widely endorsed international policy prescription. While it might seem odd that the enforcement of a CML encountered resistance, a more detailed assessment, based on a governance framework, suggests that this might have been expected.

Burris et al. (2005) and Wood and Shearing (2007) outline a nodal governance framework for assessing complex systems such as cities. The framework, an elaboration of contemporary network theory, defines governance as intentional activities designed to shape the flow of events, and governance nodes as sites – both institutional and geographical – where people collectively work to manage and shape outcomes (Burris et al., 2005). According to Wood and Shearing (2007), each node can be understood as exhibiting four essential characteristics: mentalities, technologies, resources and institutions. Mentality refers to a way of thinking about the matters that the node has emerged to govern, i.e. the ways in which the problems and solutions considered to be within the node's purview are understood. Technologies are the set of methods and tools, including sea-level rise models and legislative instruments, used to exert influence over the course of events. Resources are those people, funding and ideas (or literatures) used to support the operation of the node and the exertion of influence and can be used to understand the respective incentives of nodes. Lastly, institutions describe the structure that

enables the directed mobilization of resources, mentalities and technologies over time. This framework for understanding governance processes provides a useful lens through which to view and attempt to explain the complexities of and contestations over the local application of the notion of a CML.

The process of establishing a CML in Cape Town revealed different perceptions of, and approaches to, coastal zone risk from various governance nodes with an interest in Cape Town's economy and spatial governance. While this may have been anticipated from the public consultation process given Cape Town's socio-economic inequality, disagreement between and within public sector departments came as a surprise. However, once different nodes are identified and the respective mentalities, technologies, resources and institutions of these nodes are recognized, the improbability of automatic consensus in managing the coastal zone becomes more obvious. This in turn assists in explaining the difficulty that is frequently experienced in implementing 'good ideas' and international policy prescripts at the local level. Indeed, the experience in Cape Town and the Overberg District Municipality reveals the difficulties that might be expected when international (and national) prescripts ignore local context. The experiences in these two municipalities suggests the need for notions of best practice to be informed by local socio-economic conditions and local governance dynamics, some of which may be specific to particular units within a given department or even the perspectives of individuals within those units.

Based on the experience in CCT and the Overberg District Municipality, it seems clear that international and national policy ideas do not represent some form of canon, introduced and adopted by unanimous local entities pursuing a single purpose. Instead, policy prescripts contain inconsistencies (McKenna et al., 2008) and gaps are assimilated at the sub-national level for a variety of motives and are interpreted and applied in a variety of ways. The implications of this appear to support Peck's (2011, p. 2) call to shift understanding of policy processes from that of policy transfer, 'Preoccupied with accounts of rationally selected best (or better) practices moving between jurisdictional spaces' to one of policy mobility and mutation, which is 'much more attentive to the constitutive socio-spatial context of policy-making activities, and to the hybrid mutations of policy techniques and practices across dynamized institutional landscapes'. Having focused in this paper on the local contestations between governance nodes over the demarcation and adoption of a CML in the case of Cape Town, it could be fruitful to draw

on Peck's notion of policy mutation as a basis for conducting a multi-scalar governance analysis, investigating how the notion and utility of a CML is translated and embedded in laws, policies and practices at different levels, and comparing this analysis between a number of municipalities that have implemented a CML.

4. 6 Conclusion: the importance of shifting mentalities

International policy advice on climate change is increasingly focused on the local level. United Nations agencies, international NGOs and multi-national companies are among those urging city mayors and officials to be proactive in managing climate change risks. The CCT's experience in applying a CML to manage sea-level rise risk illustrates that the adoption and implementation of many prescribed policy guidelines is neither automatic nor easy (Chapter Five further illuminates this), no matter their intrinsic or theoretical merit. More specifically, too many international (and possibly national) prescripts underestimate the difficulty with which complex, dynamic, politically contested cities and their institutional idiosyncrasies might transition from their current approaches to those recommended, the ambitious nature of that transition, and the resistance to change from locally vested interests (Resnick et al., 2012).

The reasons given for the difficulties experienced in effectively managing sea-level rise risk include inconsistencies in ICZM guidelines (McKenna et al., 2008), a perceived lack of climate change awareness outside of CCT departments responsible for the environment, and the lack of a strategic coastal planning strategy (CCT, 2012a). The experiences documented in this paper suggest that whatever policy and capacity deficits exist, they are compounded by conflicting institutional incentives and perspectives across departments at the local level. In Cape Town, progress in converting policy into effective implementation was compounded by deep-seated socio-economic attributes and under-acknowledged differences between governance nodes at the local level.

What is possible, and indeed necessary, is that some of the insights gained while negotiating the CML gain a wider appreciation within the CCT. That is, that an effort be made to narrow and develop the 'mentality' with which different CCT departments operate, and that this mentality adapts to reflect the changed and changing reality under its jurisdiction, both biophysical and socio-economic. Wider collaboration is the means by which to augment the CCT's capacity, but a shift in mentality is a prerequisite for engaging

with appropriate nodes and increasing the effectiveness of the collaboration. Section 7.3 of Chapter Seven, namely: ‘Informal networking towards a better “goodness-of-fit”’ and ‘Matching knowledge construction with the system-to-be-governed’ provides some suggestions on how this may be achieved.

Chapter 5:

An alternative and inclusive approach to implementing Coastal Management Lines

This chapter is a minor revision of the article:

Colenbrander, D. R., & Sowman, M. R. (2015). Merging Socioeconomic Imperatives with Geospatial Data: A Non-Negotiable for Coastal Risk Management in South Africa. *Coastal Management*, 43(3), 270-300.

5.1 Introduction: Coastal Management Lines caught in the sustainable development paradox

Coastal zones are unique spaces of high socioeconomic and ecological value (DEAT, 2000; De Wit et al., 2009). While there have been a multitude of attempts to describe and define the coastal zone,⁵³ there is no single, universally accepted definition of what the coastal zone is, nor the position of its spatial extent (Cicin-Sain et al., 1998; Atkins, 2004; Garber, 2005, cited in Schwartz, 2005). McFadden et al. (2007) broadly describe the coastal zone as a nexus of interacting socioeconomic and dynamic natural systems. Similarly, Van den Bergh and Nijkamp (1997) reflect on the economic importance of the coastal zone as a concentration point for industrial activities, a communication and transportation area for goods and services, and a vulnerable ecosystem of invaluable quality. These descriptions of the interface between land and sea reflect not only a dynamic system that provides important socioeconomic opportunities, but also a biophysical system with unique attributes that attracts a multitude of interests and values to this 'transitional space'.

Because of the value and strategic importance of the coastal zone, a range of coastal policy and legal frameworks have been developed to promote effective governance of the coast and its resources. This has proven a difficult task, however, both internationally and locally. Coastal policies and decision-making have historically been formulated by, and made within, individual sectors (Cicin-Sain et al., 1998). The application of a sectoral and fragmented approach to what is a dynamic and contiguous system has resulted in ambiguity, overlapping and often competing rights, restrictions and unclear responsibilities (DEAT, 2000; Binns et al., 2003; Atkins, 2004; Williamson et al., 2005; Glavovic, 2006). The recognition of the limitations of this sectoral approach has necessitated a shift to a more integrated, participatory and adaptive management approach (Clark, 1996; Van den Bergh & Nijkamp, 1997; French, 2004; Christie et al., 2005; Rajabifard et al., 2005; Williamson et al., 2005; DEAT, 2006). Ideas on how this may be achieved have been enshrined in integrated coastal management (ICM), which 'seeks to integrate policies and actions across sectors, as well as recognizing the interlinked nature of the natural environment of coastal land, estuaries and inshore waters' (Atkins, 2004, p. 1). The evolution toward a management approach that is configured to the contextual realities of the coastal space has resulted

53 "Coast" in the context of this article is defined as the area of land that directly influences or is influenced by the sea.

in ICM being widely accepted in literature, policy, and praxis. Today ICM is considered the most appropriate governance framework to promote the sustainable use and management of coastal resources and areas (Bower & Turner, 1998; Cicin-Sain et al., 1998; Olsen, 2003).

Coastal management in South Africa has followed a similar trajectory. From ad hoc sector-based management in the 1970s (Sowman, 1993), coastal management in South Africa has gradually evolved to a more systems-oriented, integrated, and people-centred approach (Glavovic, 2006). This has been stimulated by the transition to democracy and a focus on sustainability, redress, and equity, as well as the promotion of good governance. The ICM policy development process initiated in 1996 embraced these principles and adopted a pro-poor discourse (Glavovic, 2006). This process culminated in the publication of a White Paper on Sustainable Coastal Development in 2000. The recognition of ICM for effective coastal governance was signified by the proclamation of the Integrated Coastal Management Act, Act 24 of 2008 (ICM Act), in 2009. The ICM Act mandates the three tiers of government with certain responsibilities and attempts to embed ICM principles into the governance of South Africa's coastal environment.

Over the past 15 years, with growing awareness of the potential impacts and implications of climate change and environmental variability, ICM in South Africa is increasingly being framed within a discourse of coastal risk governance. In this approach, risk is defined as threats to people and the things they value (Kasperson & Kasperson, 2001). In the context of emerging pressures associated with climate change, sea-level rise and increased storminess, risk aversion is becoming a key constituent of spatial planning and urban design in coastal municipalities. Indeed, the relevance and usefulness of ICM principles in climate change adaptation is being increasingly recognized and applied (Chemane et al., 1997; Nichols & Klein, 2005). Framed against the people-centred, pro-poor imperative of ICM in South Africa, a distinctive dichotomy is arising in coastal planning discussions at the city scale: how to maximize the socioeconomic potential of the coast through economic development strategies that will benefit the poor while simultaneously remaining risk averse to coastal hazards. Coastal development, although necessary as a conduit to harness the socioeconomic potential of the coast and thus benefitting local communities, stands to also raise the risk profile due to emerging pressures of climate change and sea level rise. The pursuit of a more modernized state through development while

remaining risk averse is reflective of the broader risk society paradigm (see section 1.5.2 of Chapter One for a deeper consideration of a 'Risk Society'). A key question underpinning this paradigm is how can the risks and hazards that may arise out of the pursuit of modernity (i.e., coastal development) be limited or distributed in a way that neither hampers the pursuit of modernity exceeds sustainability limits (Beck, 1992).

Internationally, a widely advocated mechanism to promote risk aversion (and thus more sustainable development) in the coastal zone is development set-backs (Cambers, 1998; San'ou et al., 2008; Winckel et al., 2008; Theron et al., 2010). Indeed, one of the mandatory requirements set by the ICM Act for municipalities in South Africa is the establishment and regulation of Coastal Management Lines (CMLs) (historically referred to as set-back lines). These are spatial planning mechanisms that define areas along the coast within which restrictions are applied to regulate the location and design of infra-structure (Fenster, 2005; Sano et al., 2008). Coastal Management Lines in terms of the ICM Act are used to promote risk averse decision-making by spatially demarcating 'hazard areas' as a consequence of coastal processes. These 'hazard areas' are defined against both temporal and spatial dimensions: the probability of coastal processes (with the potential to cause harm or damage) taking place within a predetermined period and the predicted spatial extent of these processes.

Coastal Management Line determination in South Africa lies chiefly in the domain of the coastal engineering discipline within the private consulting industry. The absence of a nationally defined CML methodology and the consequential reliance by the state on consultants, in particular consulting engineers, to develop methodologies is producing CMLs that are mechanized and biased toward the strengths of this industry; namely, numerical modelling of biophysical processes. Factors that form the basis of such CML determination are largely biophysical (e.g., erosion trends, movement of windblown sand) and technical (e.g., sea-level rise and storm surge run-up predictions) (Watts, 2012; DEA, 2013; Kavonic, 2013). While predicting risk from coastal processes through empirical modelling is an important component of CML delineation, the exclusive reliance on a technical approach is failing to capture local realities, including social dimensions, and thus failing to pay attention to a key principle underpinning ICM, namely social inclusiveness. As a consequence, there is increasing recognition of the need to adopt a more integrated, multidisciplinary and inclusive approach

toward establishing CMLs (Schoonees et al., 2008; Theron & Rossouw, 2008; Smith, 2010).

It is well known that the use of CMLs as a spatial and land use planning tool has significant socioeconomic implications (Daniel & Abkowitz, 2005; Cartwright, 2008; Mather, 2008; Breetzke et al., 2012; Kirkpatrick, 2012; Watts, 2012; Kavonic, 2013). While reference is often made to the need to address social and economic considerations in establishing CMLs in South Africa (Mather, 2007; Schoonees et al., 2008; Theron & Rossouw, 2008; Smith, 2010), there is very little, if any, literature that provides pragmatic guidance on how to address and integrate socioeconomic dimensions into defining CMLs at the local level. This is surprising given the centrality of sustainability thinking to all forms of planning (see Todes et al., 2005; Sowman & Brown, 2006).

This article takes as axiomatic that CMLs as coastal spatial planning mechanisms cannot be determined within a positivist vacuum of biophysical modelling as a means to understand and manage risk. To do so exposes a fundamental flaw and contradiction, because the concept of risk is, after all, a social construct: risk would not be a notion if it were not for the societal value attached to the coast. Coastal Management Line methodologies and the processes that drive the implementation of CMLs must become sensitized to, and inclusive of, social, cultural, economic, and broader environmental dimensions. In considering these broader influences (within the IG framework) on the formulation of CMLs as important adaptation strategies, this chapter provides a response to sub-question iv, namely: 'How do governance elements external to local government shape and influence the implementation of coastal adaptation strategies and what are the implications thereof?'

The recognition of the need to consider economic, social and environmental elements brings into focus the 'pillars' of sustainable development. The simultaneous pursuit of these pillars or the 'triple bottom line' is, however, not unproblematic and forms the basis of the broader critique of sustainable development. Although sustainable development offers an alluring and holistic 'solution' to the world's crises, there is much literature that argues the concept of sustainable development at best presents a vague idealism. The vagueness of the concept is no longer a basis for consensus, but rather a source of contestation and disenchantment (Daly & Townsend, 1996; Giddings et al., 2002), with some labelling sustainable development as an oxymoron:

fundamentally contradictory and irreconcilable (Kates et al. 2005; Redclift, 2005). Considering this critique, and within a planning paradigm, this research applies Campbell’s conceptual framework of the Planners Triangle (see section on ‘Sustainable development through the planner’s lens’ & Figure 5.1) to examine the tensions that may arise between the social, economic, and environmental dimensions in pursuit of promoting sustainable development. More specifically, these tensions are examined through the process of establishing CMLs as coastal spatial planning mechanisms as a means to promote sustainable coastal development. This analysis is conducted through a comparative study of two CML methodologies employed respectively by two municipalities in the Western Cape. Lessons and insights from adopting a more integrated, inclusive and iterative process—one that seeks to identify and consider a range of parameters that should inform CML delineation — are provided.

Figure 5.1: The Planners Triangle



(Source: Campbell, 1996).

The comparison of the two methods employed in the City of Cape Town Municipality (CCT) and Overberg District Municipality (ODM) was undertaken through a review of literature including unpublished and published documents, consultant reports, theses and departmental policies, meeting minutes, internal Municipal, Provincial, and National reports, and

scholarly articles on CML methodologies, both national and international. As lead author of this research I am also an employee of the CCT within the Coastal Management Unit of the Environmental Resource Management Department. In addition to project managing the establishment of the CML in the CCT, I was a member of the Technical Steering Committee established by the Western Cape Provincial Government authorities for the ODM CML project. Thus additional data was gained from discussions with stakeholders, stakeholder response reports from public participation processes and participant observation as well as notes from both informal and formal stakeholder engagement sessions. While neutrality cannot be claimed in presenting this research, my 'embeddedness' and positionality in the subject matter, as opposed to a third party post hoc analysis, has enabled an elevated insight and detailed analysis into the processes and methods of defining CMLs that would not otherwise be achieved.

5.2 Problematizing Coastal Management Lines

Legislation in South Africa requires that once CMLs are defined, their position be reflected on municipal zoning scheme⁵⁴ maps (DEAT, 2008, s 25(3)). A CML, as a line drafted into a municipal zoning scheme map, represents an absolute and one-dimensional physical space. The expression of risk on maps through the use of CMLs thus implies that risk from coastal hazards can be mapped absolutely and precisely. Similarly this suggests that CMLs and associated planning schemes can only deal with static representations of risk. This becomes problematic considering that coastal hazards are a function of dynamic processes, an inherent trait of coastlines. The outputs of empirical methodologies that generate information used to determine the position of CMLs are, however, subject to degrees of uncertainty. This uncertainty is conveyed by error bars, which are inherent to the science of modelling and may be associated with any number of anomalies. In the case of sea-level rise, shoreline responses to changing levels, and the determination of wave run-up scenarios into the future from storm surge events, there is uncertainty surrounding regional sea-level rise predictions and the subsequent range of sea-level change scenarios, and in climate change predictions (Reilly et al., 2007; Mather, 2012). Indeed, uncertainty surrounding the complex and

54 A zoning scheme is a legal document that records all land use rights on properties within the jurisdiction of municipalities and generally serves to manage urban growth and to conserve the natural and cultural environment (Western Cape Government, 2004). Coastal Management Lines are indicated on zoning scheme maps to allow the public to determine the position of the CML in relation to existing cadastral boundaries (Celliers et al., 2009).

nonlinear interactions within coastal systems is a major challenge to coastal governance (Adger et al., 2005b). The impact of a warming atmosphere on coastal ecosystems and of the uncertainties surrounding ecosystem responses is set to exacerbate this challenge (Jentoft, 2007; Abel et al., 2011).

Uncertainty surrounding these coastal dimensions ultimately filters down to defining the physical position of CMLs at a local level. In the context of South Africa this is typically countered through the application of conservative modelling estimates. While this may be seen as best practice, conservative estimates in defining CMLs are also a means to avoid potential liability claims. While it may be argued that a happy medium between a conservative and a liberal estimate can be defined, the process is subject to interpretation and subjectivity. The scope for subjectivity is compounded by a lack of clarity regarding the process of defining CMLs and setting risk thresholds and planning periods to be incorporated in CML methodologies. In the absence of a nationally determined risk-modelling standard for CMLs in South Africa, establishing CMLs has become the domain of the consulting industry, each firm with its own methods and interpretations. The uncertainties associated with climate change and coastal modelling, as well as the range of interpretations and methodologies applied by consultants, militates against the desired final product of a crisp and absolute representation of a hazard area portrayed by a line or lines on a map. This becomes problematic from a coastal planning perspective where coastal real estate (and implied development options) is becoming increasingly sought after.

A great deal of attention is being given to developing CMLs in South Africa⁵⁵ at present, particularly at the city level (Cartwright et al., 2012). Firstly, from a coastal hazard perspective, CMLs are regarded as critical spatial planning interventions necessary to promote risk aversion in planning for and managing development in coastal areas (Schwartz, 2005; DEAT, 2008; Sano et al., 2008; Mather, 2012). Secondly, the ICM Act has made it mandatory for all coastal municipalities to delineate CMLs within four years of the commencement of the ICM Act. In terms of the Act, the intention of the CML is to, among other things, 'protect coastal public property, private property and public safety' (DEAT, 2008, s25(1)(a)(i)). Although, at the time

55 At the time of writing of this article, the four coastal provinces in South Africa were at various stages of developing and formalizing CMLs according to the requirements of the ICMA.

of writing, the deadline had not been achieved, municipalities had by and large initiated the process of defining CMLs, and these are expected to be formalized over the coming years.

5.3 Sustainable development, coastal risk, and the Planner's Triangle

The legislation dealing with CMLs in the ICM Act not only signifies the growing risk-consciousness in the field of ICM, but also affirms the role of spatial planning as an increasingly influential discipline in promoting sustainability. Similarly, if one considers that the broad purpose of spatial planning is to provide stewardship for the continued well-being of the planet, which includes the natural and constructed environment (Hillier & Healey, 2010; Balducci et al., 2011), then spatial planning is being increasingly informed by sustainability principles (Campbell, 1996; Rotmans et al., 2000; Myatt et al., 2003; Healey, 2004; Kithiia & Dowling, 2010; Boateng, 2012; Klain & Chan 2012). Indeed, the emphasis on establishing CMLs in South Africa indicates the increasing importance of promoting risk aversion as a basic tenet in the pursuit of more sustainable forms of coastal development (see 'Framing Risk Aversion within the Planner's Triangle' below).

5.3.1 Sustainable development through the planner's lens

Planners increasingly face tough decisions, and subsequent trade-offs, in protecting the green city, promoting an economically growing city and advocating social justice (Campbell, 1996). Contemporary pressures, particularly in the global South, of rapid urban growth, in-migration and climate change are adding to the complexity that decision makers must negotiate in responding to these pressures (Dodman et al., 2012). The utility and usefulness of spatial planning in responding to these pressures and promoting more sustainable forms of development are increasingly being acknowledged in the literature (Bower & Turner, 1998; Cicin-Sain et al., 1998; Boateng, 2012). While spatial planning may be a useful tool in this regard, its application toward promoting principles of sustainability lodges it squarely within the 'conundrum' of sustainable development. Indeed this 'conundrum' may be exemplified by the differing interpretations of sustainable development held by those responsible for facilitating planning frameworks toward increased degrees of sustainability. Using a spatial planning lens, Campbell (1996) offers the framework of the Planner's Triangle (Figure 5.1) to conceptualize and address the inherent complexity and trade-offs required to achieve sustainability in planning praxis.

Each of the corners of the Planner's Triangle represents one of the three pillars of sustainability: social (social justice, economic opportunity, and income equality), economic (economic growth and efficiency) and environmental (environmental protection). The centre of the triangle represents the ideal objective: sustainable development, an outcome of balancing the three targets. As Campbell (1996, p. 1) suggests, 'It is one thing to locate sustainability in the abstract, but quite another to reorganize society to get there.' The triangle is therefore not advocated as the underlying geometric structure of the planner's world, but rather applied for its conceptual simplicity in framing the challenges inherent in the pursuit of sustainable development (Campbell, 1996). If the three corners of the triangle represent the key goals of planning, and the centre represents sustainable development, the three axes represent the divergent interests involved in navigating toward the goal of sustainability. For example, one of the more challenging puzzles of moving toward this goal lies in the development conflict of the social-environmental axis: how does one increase social equity while simultaneously promoting the environment, whether in a steady state economy or not? Similarly, how do the marginalized find greater economic opportunity if the protection of the environment requires diminished economic growth? (Campbell, 1996).

Campbell (1996) describes property conflict as the boundary between private interests and public good. Campbell argues that there is a contradictory tendency (within capitalist, democratic societies) to define property as a private commodity but at the same time depend on government interventions to ensure the social benefits of this property. Campbell (1996) goes on to suggest that the relationship between growth and equity is more complex given their mutual dependence. This culminates in the private sector simultaneously resisting and depending on government-led interventions. In short, planners must promote economic growth, ensure that the benefits of this growth are distributed equitably and, in the process, see to it that this equitable economic growth does not result in the degradation of the natural environment (Campbell, 1996).

The planner's role in the pursuit of sustainable development is not limited to the negotiation of the resource, development and property conflicts; it is also shaped by a number of external factors. For example, the task is made more complex and challenging by the obligation to operate within a governance system that is guided by a multitude of different policies and legislative frameworks, which are not always aligned and may, at times,

express competing objectives (Sowman & Brown, 2006). These influences, or limitations, typically arise as a consequence of the need to serve narrower institutional or political interests. Notwithstanding attempts to work outside these limitations, they often result in planners representing the interests of a particular institution or political agenda (Marcuse 1976 & Hoffman, 1986, both cited in Campbell, 1996).

5.3.2 Framing risk aversion within the Planner's Triangle

In a coastal context the link between risk and sustainable development is reflected in the global desire to avoid the costly and unsustainable state created by the 'development-risk-protection' cycle (Cooper & McKenna, 2007; Boateng, 2012). Using sea defence mechanisms to address sea-level rise and coastal erosion locks society into a perpetual commitment of increasing cost, which manifests not only through the direct financial expense of constructing and maintaining sea defences, which puts pressure on the local economy, but also indirectly through negative impacts on the environment and amenities, such as loss of beach, with consequent social impacts (Cooper & McKenna, 2008). This 'development-risk-protection' cycle is becoming an increasingly prevalent phenomenon as a consequence of the compounding effects of sea-level rise, expanding coastal cities and the subsequent demand for more coastal land (Cooper & McKenna, 2007; Colenbrander et al., 2012). Thus, planning for risk aversion becomes a core constituent towards achieving sustainable development. As the CML is one of the key spatial planning mechanisms used in promoting sustainable coastal development, this research applies Campbell's (1996) conceptual framework of the Planner's Triangle to focus on and understand the social, economic, and environmental tensions that arise out of the process of defining CMLs in two different contexts in the Western Cape province of South Africa. Insight gained from these two case studies will be used to formulate a set of principles aimed at informing and guiding CML methodologies that are more attuned to best practices in ICM.

5.4 Two case studies

5.4.1 Overberg District Municipality

The Overberg District Municipality (ODM) is located in the Western Cape Province of South Africa (Figure 4.2). Its coastline of 304 km comprises approximately 25% of the length of the Western Cape coast and 10% of the South African coast (ODM, 2013a). The ODM coastline is characterized by a range of habitats that include rocky headlands, sandy beaches, and mobile dune systems (Turpie & De Wet, 2009). The range of habitats and the dynamic

nature of the coastline make it both sensitive to coastal development and, simultaneously, a source of risk to development (Stewart Scott International, 2011; ODM, 2013b). The ODM has a Mediterranean climate, with the warm, dry season over the summer months (November to April) and winter rainfall mainly from May to October (Turpie & De Wet, 2009). With a population of approximately 258,176 (ODM, 2013a), the ODM constitutes the second-smallest district economy outside of the Cape Town metropole. There is an accelerating tendency of population depletion in the inland municipalities, while coastal municipal areas are experiencing rapid growth (ODM, 2013a). The agriculture, hunting, forestry and fishing sectors account for the highest employment rate of 21.3% (ODM, 2013b).

Method and process of determining the Coastal Management Line

The Western Cape Provincial Government (Province) appointed a private consulting firm with specialist expertise in coastal engineering to determine the CML in the ODM (Table 5.1 for tabularized differences between the ODM and CCT methodologies). The main purpose of this exercise was to determine a line below which development would be more stringently controlled, if not prevented, as a consequence of the presence of coastal hazards in this area. The methodology employed by the consulting firm focused on the empirical modelling of biophysical processes (SSI, 2011). This included an analysis of wave run-up, sea-level rise scenarios, erosion trends, movement of the high-water mark, coastal bathymetry and beach profiles, wave and wind climate, storm surges and return periods, migrating estuary river mouths, and the aeolian movement of sand (SSI 2011). This list of criteria is consistent with what the Oceans and Coasts branch of the national Department of Environmental Affairs considers important in determining coastal CMLs (DEA, 2013). In the context of a peri-urban environment, the area deemed to be at risk to coastal hazards based on the modelling outcomes (applied against a 100-year planning horizon) constituted approximately 20% of the total surface area of the zoned residential area (Kavonic, 2013).

No ground truthing through site inspections of the modelled CML were undertaken. It was deemed unfeasible, owing to time and budget constraints, to ground-truth localized biophysical characteristics as a means to ‘calibrate’ the modelled CML (Breetzke et al., 2011). This shortcoming was addressed as far as possible through a remote desktop analysis of aerial imagery (Breetzke et al., 2011). The methodology employed focused exclusively on biophysical processes and did not consider socioeconomic dimensions in the development

of the method due to the practical difficulties of engaging with Interested and Affected Parties (I&APs) over an extensive stretch of coastline which was made more difficult due to time and budget constraints (SSI, 2011). Upon completion of the modelled CML, the consulting firm presented the CML to the public through a formal Public Participation Process over a period of six months in 2011. The Public Participation Process was advertised in local newspapers in two languages (English and Afrikaans), notices posted at public venues and information leaflets were distributed. Advertisements included a notice of intention to develop CMLs, a description of the study area, overview of the method applied and an invitation for the public to register as an I&AP. A stakeholder database was developed and updated throughout the Public Participation Process. This database was used as a means to distribute information and facilitate communication between SSI and registered I&APs and affected parties (SSI, 2011).

The Public Participation Process consisted of two rounds of public engagement. Each round included five formal focus group meetings in centrally located venues where local residents and other I&APs and affected parties could raise objections and engage in discussion with the consultants. In addition to these formal sessions, ad hoc engagement with the public took place throughout the period by telephone and e-mail, and face to face discussions (SSI, 2011). The final round of public engagement was followed by a six-week period of comment (SSI, 2011).

5.4.2 City of Cape Town Municipality

The CCT has a coastline that comprises approximately 20% (240 km) of the length of the Western Cape coast and 8% of the South African coast. Cape Town as a metropolitan area has the longest urban coastline in South Africa. The south-east quadrant of Cape Town comprises False Bay, which is a large (more than 1,000 km²), relatively shallow bay not exceeding 80 meters in depth (Du Plessis & Glass, 1991). The False Bay coastline is characterized by long stretches of beach divided by rocky headlands (Du Plessis & Glass, 1991). This area constitutes the southern end of an extensive low-lying flat plain referred to as the Cape Flats, which extends to Table Bay in the north-west (Figure 4.2). The western and eastern flanks of False Bay comprise steep cliff faces rising out of the ocean. The western seaboard on the Atlantic coast (north of the central business district) consists mainly of sandy beaches. Cape Town shares the ODM's Mediterranean climate, and is often referred to as the 'Cape of Storms' due to the frequent high seas associated with cold fronts

during the winter months. With a population of approximately 3.8 million, the City of Cape Town constitutes the largest economy in the Western Cape. The physical footprint of urban growth in Cape Town is expanding at 12 km² per annum, with 25 000 low-income houses constructed each year. Currently there is a backlog of 330 000 housing units, with demand outstripping supply and informal settlement consequently growing by 13% per annum (Turok et al., 2010).

Method and process of determining a Coastal Management Line

The CCT is better resourced than other coastal municipalities in the Western Cape, so the delineation of the CML was undertaken in house by the Coastal Management Unit (CMB) of the CCT's Environmental Resource Management Department. The process of defining a CML commenced in 2007 and required continuous engagement (through formal and informal discussions) with different stakeholder groups over four years (CCT, 2012a). Feedback from the formal and informal stakeholder engagement process enabled officials of the CMB to engage in a reflexive process and, through a participatory, iterative, and adaptive learning process, gain information and understanding to inform the CCT's CML methodology. Recognizing the sensitivities surrounding the delineation of CMLs, the CCT made a point of engaging with I&APs and affected parties informally over a long period before undertaking a formal Public Participation Process. 'Informal engagement' in this context is defined as engagement not required in terms of the CCT's formal Public Participation Process, which entails a set of politically approved norms and standards that conform to the requirements of the Constitution of South Africa (CCT, 2013). The informal engagement consisted of CMB officials facilitating discussions with a range of interest groups, namely provincial and national spheres of government, ratepayer associations, community interest groups, nongovernmental organizations and political representatives⁵⁶ from each of the CCT's coastal districts. These discussions focused on the following:

- Identifying coastal pressures caused by biophysical processes and urban development;
- Understanding how these pressures impact local residents, businesses, and beach users;

⁵⁶ Engagement with political representatives included mobile workshops along the CCT's coastline.

- Clarifying the legal mandate of the City to establish CMLs in terms of the ICM Act and the environmental, social and economic implications of CMLs;
- Obtaining feedback from I&APs and affected parties as a basis for understanding key principles that should inform the defining of CMLs, and
- Proposing additional principles in determining a CML methodology and gauging public support for these principles (CCT, 2012a).

During this process of informal engagement with the various I&APs and affected parties, officials from the CMB hosted workshops in each of the CCT's eight planning districts. These workshops were attended by representatives from a range of CCT departments, as well as other stakeholders. Based on the outcomes of these informal engagement sessions, the CCT identified key themes that needed to inform CML delineation. These included:

- Biophysical informants of sea-level rise and wave run-up modelling;
- An analysis of biodiversity networks and the presence of 'green belts' along the CCT's coastline;
- Coastal dynamic processes such as migrating estuarine and dune systems;
- Socioeconomic informants such as the need to promote access to and derive equitable benefit from the coast through the conduit of nodal development;
- The consideration of legal implications, impacts on property values, and development rights as a consequence of the CML, and
- Aesthetic, heritage and sense-of-place considerations.

Following the completion of the draft CML, the CCT then developed a draft by-law as a regulatory mechanism to support the CML. Both the by-law and the CML were taken through a formal Public Participation Process lasting a month and comprising the following process:

- Advertisement of the draft by-law and CML in local newspapers;
- Placement of the relevant documents in sub-council offices and CCT libraries for public comment, and
- Web advertising, including an interactive option for members of the public to see the position of the CML on a map in relation to individual properties.

Table 5.1: Summarized comparison between the two municipalities: process and method

Process factor	City of Cape Town Municipality (CCT)	Overberg District Municipality (ODM)
Funding agent	CCT	Provincial Department of Environmental Affairs and Development Planning
Project implementer	CCT: Coastal Management Unit	Private consultant: SSI
Duration of project	Four years	Six months
Informal** engagement	Yes	Yes
Formal public participation process	<p>Presentations by CMB officials to ratepayer associations and other I&APs focusing on (a) the identification of pressures along the city's coastline, (b) the identification of impacts of these pressures and understanding how impacts are experienced by local residents and beach-goers, (c) explaining the legal mandate of the CCT to establish coastal regulatory mechanisms, especially CMLs, as per the requirements of ICMA, (d) proposing key principles (and gauging public 'buy in' to these principles) in the delineation of a CML, and (e) obtaining feedback from stakeholders and members of the public as a basis for drafting a formal methodology for delineating the CCT's CML.</p> <p>Ad hoc engagement by means of telephonic conversations, e-mails and face to face discussions during this four year period.</p> <p>On-site workshops with I&APs (CCT, 2012a).</p>	Ad hoc engagement by means of telephonic conversation, e-mails and face-to-face discussions over a period of six months.
Formal public participation process	Yes	Yes
Mode of formal engagement	<p>Advertisement of draft by-law (proposed control mechanism to the CML) in 14 local newspapers</p> <p>Advertisement of draft by-law in 24 sub-council offices and 105 CCT libraries.</p> <p>Web advertising, including an interactive option for members of the public to clearly see the position of the CML in relation to private properties.</p>	<p>Two rounds of formal public engagement sessions, each including five formal focus groups in centrally located venues.</p> <p>Advertisement in local newspapers in English and Afrikaans.</p> <p>Notices posted at public venues.</p> <p>Leaflets distributed</p>
Commenting period for PPP	Four weeks	Six weeks
Method		
Biophysical considerations***	<p>Yes</p> <p>Sea-level rise</p> <p>Wave run-up</p> <p>Biodiversity network</p> <p>Aeolian movement of sand</p> <p>Estuary dynamics</p>	<p>Yes</p> <p>Sea-level rise</p> <p>Wave run-up</p> <p>Erosion trends</p> <p>Aeolian movement of sand</p> <p>Estuary dynamics</p> <p>Movement of the HWM</p>
Socioeconomic considerations	Yes	No
Ground truthing	Yes: on site workshops and inspections	No (undertaken instead through analysis of aerial imagery).
Detailed regulations published in conjunction with the CML	Yes: by-law	No

** The term "informal" is used as these stakeholder engagement sessions were not part of the City's formal public participation process to which there are a set of CCT approved standards and conditions that conform to the requirements of the Constitution of South Africa.

*** The emphasis of this paper is a comparative analysis of the processes employed to define and establish CMLs rather than a technical comparison into the modelling of biophysical parameters used to delineate CMLs. This table therefore only presents the salient biophysical aspects considered between the different methods.

5.5 Outcomes and consequences: Overberg District Municipality

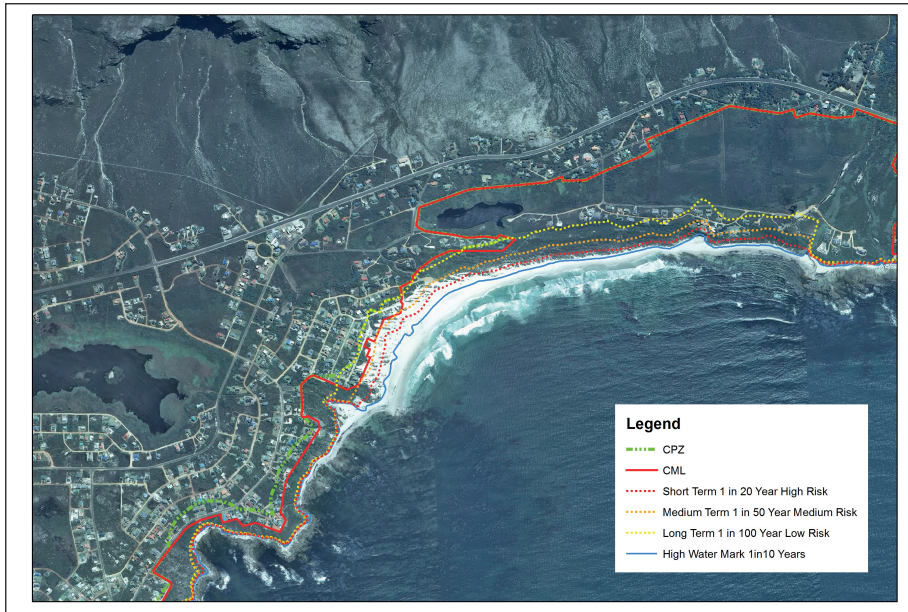
5.5.1 Opposition to the proposed Coastal Management Line

The absolute demarcation and formalization of hazard areas through the establishment of a CML on zoning scheme maps in the ODM signified the undesirability of these now spatially explicit areas. While it is the intention of CMLs to be unambiguous, such a precise demarcation of hazard areas becomes problematic on coastlines where existing properties and development rights are located. The explicit demarcation and the subsequent formalization of hazard areas and the application of supporting draft regulations geared toward prohibiting and restricting further development in the ODM effectively labelled properties that fell within this newly defined area undesirable. In real terms this had significant and far-reaching negative socioeconomic impacts. As the project manager noted:

Stakeholders who earn a living from development activity in the coastal zone raised extreme concern around the implementation of the draft regulations and lines. These concerns relate to the loss of employment opportunities and reduction in property values due to the development restrictions implied by the regulations. Many stakeholders felt that this would have the knock-on effect of severely impacting the local economies of areas such as Betty's Bay and Pringle Bay (Breetzke et al., 2011, p. 9).

The negative impact of CMLs on property values is not unique to the South African context. Similar impacts have been experienced in establishing CMLs and associated regulatory mechanisms in other parts of the globe (McGuire, 2014; NOAA, 2014). The 'tag' of undesirability imposed on approximately 20% of the zoned residential area of the ODM (Figure 5.2) raised a number of additional concerns. These included the potential stagnation in property value appreciation over time and the subsequent loss of rates income for the municipality due to the decline in property value (Breetzke et al., 2011; Watts, 2012, Kavonic, 2013). Also noted were a number of indirect impacts expected to filter beyond the spatial area demarcated by the CML to the broader communities of the ODM. These indirect impacts were linked to the reduction in the rates base, which would translate into less income for municipalities and a subsequent decrease in the provision of basic services to the broader municipal area. This in turn was considered to have potential negative implications for the desirability of the area as a place to live in, as well as the tourism potential and tourism-derived revenue of the region (Kavonic, 2013).

Figure 5.2: The various modelled lines in the Overberg District Municipality used to inform the position of the final Coastal Management Line



(Source: SSI)

Notwithstanding the possible misunderstanding by ratepayers of the purpose of CMLs, concerns regarding the implications of the proposed CML led to the appointment of legal representatives by landowners who feared that their constitutional rights were being compromised by the proposed CMLs and supporting regulations (SSI, 2011). The overwhelming sentiment towards the process of defining a CML for the ODM was one of negativity and concern, which ultimately led to the failure of the formalization of the CML and of its supporting regulatory mechanisms (SSI, 2011; Kavonic, 2013).

5.5.2 Axes of conflict in the Overberg District Municipality

Campbell (1996) argues that the process of achieving sustainable risk-averse development requires sensitive navigation of the divergent interests of the social, economic and environmental pillars of sustainability. The ODM case study reveals that the axes of conflict of the Planner's Triangle were ubiquitous in the process of establishing a CML.

The property conflict

The ODM's initiative represents local government's intention to promote sustainable and risk-averse coastal development as a social benefit to serve the public good. The negative reaction to the CML as a consequence of the impacts on property values in the ODM represents resistance to such initiatives. At the same time, those that stood to benefit from the intervention supported it. In the case of the ODM, the relative strength of resistance and support was based on physical position in relation to the CML. Those with property interests on the seaward side of the CML resisted it (due to the negative impact on property values as a consequence of this newly demarcated area being classified as 'at risk'), while those on the landward side supported it due to their properties being classified as 'risk free' and thus not having an impact on property values (Kavonic, 2013). This binary of resistance and support to the CML supports Campbell's argument that the private sector simultaneously resists and depends on state-led interventions intended to be in the interests of the broader community. The establishment of a CML becomes implicated in property conflict and as such requires a balance to be achieved between the two sets of interests.

The influence of external factors

As Campbell (1996) suggests, it is one thing to locate sustainability in the abstract (as the centre point of the Planner's Triangle), but another to achieve it in reality. The process of reconciling divergent interests between the three goals of sustainability is more complex than the conceptual representation of the Planner's Triangle. The complexity is compounded by a range of external influences that tend to restrict planners as they try to navigate toward sustainability. These factors may include the influence of governance and political processes, foreign investment, and professional or fiscal constraints. The process of defining a CML in the ODM was influenced by many of these external factors.

Governance processes and stakeholder engagement

One of the findings in the analysis of the stakeholder feedback process in the ODM revealed that there had been insufficient public engagement. According to Ron Cox, visiting associate professor, University of New South Wales (personal communication, February 28, 2012), the perceptions of the public were that the process of determining a CML had come 'out of the blue' and that the prescription of the CML was perceived as an authoritarian act of governance. While the importance of dialogue and engagement in the

process of defining CMLs was broadly recognized (Breetzke et al., 2011), the shortness of the period of public engagement led to a negative, and in some respects, hostile response toward the process of defining the CML in the ODM. This was a result of inadequate public engagement for listening to views and concerns and integrating the public voice into the process, which may have led to a different outcome. The time restriction was by no means intentional, but merely a consequence of the requirement to spend the provincial budget within the annual financial cycle. This supports Campbell's argument that fiscal constraints, as an external limitation, restrict the leeway of planners (in this case the consultants). Working within the scheduling constraints of the financial cycle, while serving the interests of the provincial government as funder, compromised the process of establishing a CML by limiting engagement with I&APs and affected parties.

While the responsibility of establishing CMLs lies with the provincial sphere of government in South Africa, the process of formulating methods to define and delineate CMLs has been, by and large, assigned to private consultants. This dependence on consultants reflects a broader challenge in South Africa, where, owing to a wide-spread lack of capacity in the governance of sustainability matters, the consulting industry occupies most of this intellectual space (Glavovic, 2006; Oelofse et al., 2006). This lack of capacity within the state provides an example of the limitations of the state. These limitations may become manifest in the absence of local knowledge, which is inevitable when consultants are appointed who are not locally based. Similarly the scope for generating and building institutional knowledge is reduced owing to the consultants concerned not having long-term interests or responsibilities attached to the project after completion. The case of Cape Town highlights the importance of giving ownership of projects to government stakeholders and local communities and, in so doing, grounding projects in local knowledge and institutional memory (see 'Outcomes and Consequences: City of Cape Town Municipality' below).

Financial constraints and ground proofing

The impact of financial constraints was not limited to public engagement. The determination of a CML in the ODM was undertaken through a desktop analysis of data, which was used to spatially map hazard areas along 307 km of coastline (SSI, 2011). Desktop automation of the CML and its application on a broad scale was necessitated by the financial constraints of the project. While this approach to mapping coastal hazards enabled the consulting

firm to keep within the financial and time constraints of the project, this approach led to the omission of ground-truthing information obtained through a desktop study. During the Public Participation Process, various irregularities between the modelled line and the biophysical characteristics on the ground were exposed. For example, some members of the public pointed out that elevated ground which was ‘out of harm’s way’ from coastal processes had been included seaward of the CML (Kavonic, 2013). This shows how inaccuracies can arise when empirical approaches are applied remotely, detached from localized realities. These irregularities contributed to the contestation of the physical position of the CML from local residents and encouraged their scepticism about the methodology applied.

5.6 Outcomes and Consequences: City of Cape Town Municipality

5.6.1 Broad approaches to Coastal Management Line determination supported

Cape Town’s method was informed by the outcomes of the participatory process. Through its engagement with a range of I&APs and affected parties, including political figures, the CCT’s CML methodology departed from the conventional approach of focusing exclusively on the empirical modelling of biophysical processes in favour of one that considered a range of socioeconomic and broader environmental factors. While the Public Participation Process ultimately yielded 97% support from stakeholders (CCT, 2012a), the process leading up to the formal Public Participation Process was not without its contestations.

Being sensitized to the socioeconomic implications of CMLs through informal engagement with I&APs and affected parties from the outset of the CML determination process, the CMB intentionally excluded private property with development rights from its CML determination exercise. The exclusion of this development⁵⁷ area by means of delineating the CML seaward of sea-frontage property along Cape Town’s coastline was considered pragmatic and ultimately ensured the support of the vast majority of stakeholders. By strategically excluding private property with development rights at risk from coastal hazards, Cape Town avoided the contentious issue of property conflict as experienced in the ODM. While undeveloped stretches of the coast with no property or development rights may now be proactively

⁵⁷ 75% (180 km) of Cape Town’s coastline consists of infrastructure that falls within 100 m of the high-water mark.

formalized as hazard areas by the CML, in developed areas the CCT is still left with the conundrum of property that is landward of its CML, but still at risk from coastal hazards.⁵⁸ Recognizing this limitation, and realizing that a CML in isolation is not capable of protecting or managing existing infrastructure at risk, the CCT has initiated the development of overlay zones. Overlay zones form part of the CCT's integrated zoning scheme and are seen as the most appropriate mechanism to manage and regulate land use and building development⁵⁹ at risk from coastal hazards on properties or land parcels landward of the CCT's CML. These areas were identified based on GIS modelled sea-level rise and storm surge scenarios (see Figure 5.3) as outcomes of the broader Sea-level Rise Risk Assessment conducted by the CCT (2012b). The zoning scheme provides for the development of overlay zones for specific purposes. The value of the overlay system lies in its ability to manage the complexity of existing property at risk through land use management regulatory mechanisms.

The application of overlay zones as an adaptation intervention signifies a significant institutional shift within the CCT in responding to climate change hazards such as sea-level rise. Initiating climate change adaptation responses has historically fallen within the exclusive domain of the Environment Resource Management Department (ERMD). However, and reflective of the cross-cutting impacts of climate change and acknowledging the limitations of CMLs in isolation in managing these impacts, the CCT has sought to develop coastal adaptation strategies that are founded across a range of departmental disciplines. The development and administration of overlay zones is a mandate of the Planning, Building, and Development Management Department within the CCT. Through combining coastal and climate change expertise from the ERMD with expertise in land use management, a 'hybrid' mechanism in coastal overlay zones has been developed. The same is true for integrating the CML that doubles as the Coastal Urban Edge⁶⁰ as reflected in

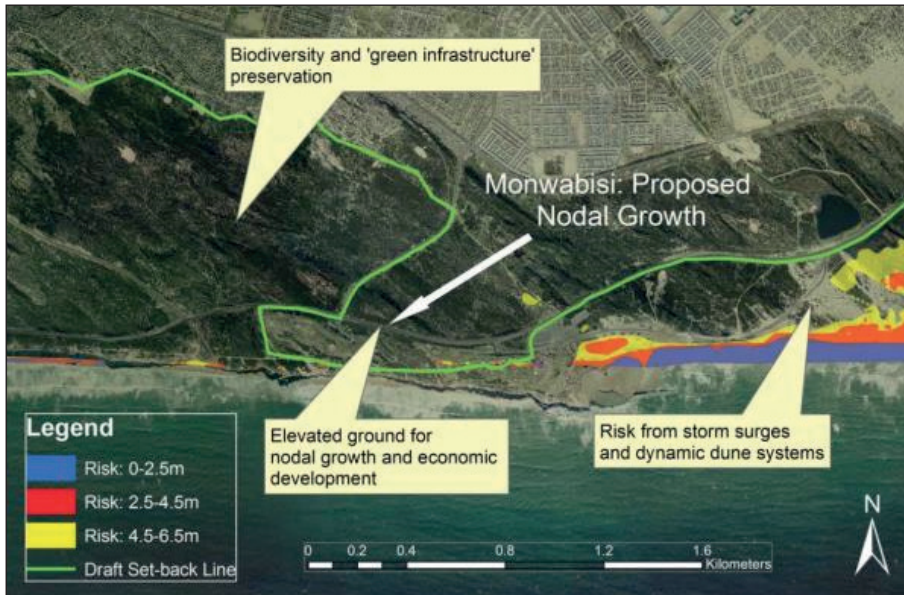
58 Although phased retreat in responding to coastal hazards and sea-level rise is widely accepted in international literature as "best practice," in many places along Cape Town's coastline this is not an option due to the value of infrastructure present—approximately R5 billion (USD 460 million) (Cartwright, 2008)—and the lack of space to accommodate relocation.

59 Considering the impracticality of phased retreat, the most effective approach to addressing existing infrastructure at risk has been identified as the regulation of land use through building code.

60 The CML doubles as the seaward equivalent of the CCT's urban edge. The urban edge delineates the outer limits of urban development over a period of time and which is subject to review. The urban edge is designed to control urban sprawl through phasing growth, promoting densification and protecting natural resources.

the CCT's Spatial Development Framework, the custodianship of which falls within the Spatial Planning and Urban Design Department.

Figure 5.3: A variable Coastal Management Line illustrating the negotiated spaces between the environmental, property and resource conflicts while simultaneously avoiding risk from coastal hazards



(Source: author)

The merger of departmental disciplines and subsequent closer working relations between departments that have historically worked in 'silos' has enhanced institutional capacity, the result of which is that the CCT is more responsive to the emerging pressures associated with climate change (Colenbrander et al., 2014). Such cross-departmental efforts towards a more systematic approach is indicative of the inter-temporal complexity associated with climate change and reflects the desire of the CCT to adopt a transformational adaptation response to global environmental change. A requisite of transformational adaptation responses (as preferred to proximate and incremental adaptation responses, which are currently failing and contributing to maladaptive practices) is an enlarged scale and intensity of adaptation responses as well as the adaptation interventions being novel (Wise et al., 2014; Kates et al., 2012). Integrating disciplines between

various departments for the development of coastal land use management and spatial planning mechanisms (overlay zones and CMLs, respectively) applied throughout the CCT's area of jurisdiction is an adaptation response of unprecedented scale, and is an entirely novel approach to municipal coastal planning in South Africa. Further signifying these institutional shifts and interventions as transformational adaptation responses is that they include a process that provides a platform of engagement, framing risk from coastal hazards as a responsibility shared between the CCT and the public. Enabling this platform to address risk through overlay zones also relates back to the principles determined by Campbell (1996)—negotiation, deliberation, and conflict resolution—in addressing the conflicts inherent in the pursuit of sustainable development. In this case the overlay zones have been developed to focus on and address the property conflict. Although the property conflict experienced in the ODM is being addressed by the CCT through a strategy of developing overlay zones and excluding private property with development rights from the CML, contestations have still arisen along stretches of the coast where there are no development rights. Typically this includes land parcels along the coast zoned as agricultural, public open space or undetermined land.

5.6.2 Addressing past inequalities

Although Cape Town is a metropolis, stretches of the coast on the outskirts of the central business district remain undeveloped. A significant proportion of these areas, excluding protected natural areas, is on the False Bay coastline in the Cape Flats region (see Figure 4.1). Exposed to harsh environmental elements, in particular strong south easterly winds in summer and frequent flooding in winter, the Cape Flats was, under the Group Areas Act (Act 41 of 1950) of the apartheid regime, designated for 'non-whites.'⁶¹ The legacy of this environmental apartheid planning persists today: much of the Cape Flats consists of low-income housing and informal settlements with high levels of poverty. These Cape Flats townships are not spatially connected to the coast, and there remains a swathe of 'vacant' land consisting largely of partially vegetated dune systems between the townships and the sea. To address the legacy of apartheid and the perception that coastal frontage property equates to economic wealth and gain, there is significant political pressure in the CCT to promote access to the coast via sea frontage development. The coastal land along the False Bay coast is an attractive option to meet the CCT's existing

⁶¹ Under apartheid policies and laws, "non-whites" denoted black, Indian, and Coloured South Africans.

housing backlog, to stimulate economic development in marginalized areas and ultimately to improve livelihoods in these communities. While the land may be considered ‘vacant’ from a property development perspective, in terms of ecosystems-based management, the presence of vegetated dune systems remains high on the conservation priority list. Not only do these systems provide important biodiversity corridors, but they double as ‘green infrastructure’ by buffering storm surges. The retention of intact ecosystems as green infrastructure remains one of the most widely advocated ways of mitigating the impacts of natural disasters, whether attributed to climate change or not (Sudmeier-Rieux et al., 2006; Renaud et al., 2013). In addition, these systems trap wind-blown sand and reduce the quantity of sand smothering city infrastructure such as coastal roads.

In the process of determining CMLs, it was assumed that in these particular regions, both objectives—promoting development and remaining risk-averse to coastal hazards through the preservation of green belts—could be achieved concurrently. As a consequence of their risk reduction potential, coastal ecosystems were largely protected through the establishment of CMLs in both municipalities. However, the more detailed and explicit process of drawing a ‘line in the sand’ to distinguish in absolute terms where development may or may not take place generated contestations along certain areas of the coast (areas characterized by high poverty, in this case the Cape Flats) and ultimately dragged the process of delineating a CML into the socio-political domain. The proposal of a CML to protect remaining green infrastructure as a means to reduce risk generated the perception among certain political representatives, as well as CCT departments, that the CML would ‘sterilize’ the coast from a developmental perspective. By implication this would prevent disadvantaged communities from obtaining the same benefits as the white minority had received under the apartheid regime, the legacy of which is still evident today in developed and affluent stretches of the city’s coastline.

5.6.3 Axes of conflict in the False Bay coast

The property conflict

Property conflict between the social and economic pillars was mostly avoided due to the CMB allowing the engagement process to shape the outcome of the CML delineation. A key outcome of this process was the realization of the need to exclude private property with development rights from the CML. However, there were other conflicts in the process of defining the CCT’s CML.

The resource and development conflict

An extension of the resource conflict presents itself as the development conflict. Lying on the axis between the social and environmental pillars, the development conflict arises out of the need to increase social equity through, for example, development interventions or the improvement of infrastructure, while simultaneously advocating environmental protection. In the case of the Cape Flats, and within the resource conflict, the CML came to represent a threat to the economic stimulation of the region. The sea views and wide-open beaches were seen as resources that needed to be harnessed not only to achieve economic emancipation by way of sea frontage development but also to stimulate economic growth. The retention of open spaces as 'green infrastructure' faced an additional hurdle in that open spaces, particularly in poor areas, are seen as crime zones, and communities are often in favour of developing these spaces as a way of removing the criminal element (Colenbrander et al., 2013). The perceived sterilization of the coast and subsequent economic stifling, as a consequence of the position of the CML limiting sea-frontage development, was seen as a direct threat to the livelihoods of disadvantaged communities and to potential development opportunities. This links directly with the development conflict: 'How could those at the bottom of society find greater economic opportunity if environmental protection mandates diminished economic growth?' (Campbell, 1996, p.6).

For example, Monwabisi has been identified by the CCT as one of three future nodal development growth points along the Cape Flats coastline to stimulate economic growth and promote livelihood upliftment for the surrounding communities (CCT, 2009b). The determination of the CML in this area was a contested process and required prolonged negotiation, both between departments and with political representatives, to resolve the competing interests of risk reduction (through an ecosystems-based management approach), economic growth and social equity. Negotiation and the need to achieve an *aurea mediocritas* between the various interests culminated in a variable line for this stretch of coast (Figure 5.4). The spatial variation in the CML represents an attempt at not only achieving a balance between the divergent interests, but also developing a CML through grounded negotiation and deliberation with I&APs and affected parties, thereby allowing the process to determine the outcome. While the Monwabisi case offers insights into how the CML was demarcated for this stretch of coast, the case study reflects the broader process applied in defining a CML for Cape Town's 240 km of coastline.

5.6.4 The influence of external factors

The burden of inherited identities

The Monwabisi experience in Cape Town demonstrated that the process of delineating a CML was not only capable of igniting resource and development conflicts, but could also become politicized. The development of a coastal CML to retain remaining coastal ecosystems in an area where poverty is rife has been likened to apartheid reinventing itself in the guise of 'environmental risk management concerns' (Colenbrander et al., 2012). This perception was probably reinforced when the CMB, as an organ of the Environmental Resource Management Department, championed the development of the CML, which was initially seen as being motivated by a green agenda. Given South Africa's history, 'green' mentalities are often associated with exclusion and elitism (Cock & Fig, 2002; McDonald, 2004). The association of the CML with apartheid agendas was probably strengthened by the fact that the officials driving the CML initiative were, in South African ethnic terms, 'white.' In response to these perceptions, officials from the CMB arranged a mobile workshop along the coast of the Cape Flats with a number of political representatives and members of the community. This exercise in social learning was used to develop local stakeholder understanding of the consequences of coastal development in areas of high environmental risk, especially for the poor, and to negotiate a CML that was broadly acceptable to all stakeholders.

The obstructive role that the social and political construction of the environmental agenda played in the process of defining a CML in Cape Town confronted the CMB with a significant and unanticipated challenge in delineating the CML for the CCT. These unanticipated anomalies, as was the case with the ODM, reflect the external factors referred to by Campbell (1996) that need to be considered, beyond just the negotiation of divergent interests between social equity, economic growth and environmental protection. Although the CCT's approach of initiating dialogue and face-to-face engagement with I&APs and affected parties over an extended period of time led to modifications of the 'ideal' CML, the resultant line now accommodates localized socioeconomic, environmental and risk concerns, and is, as such, broadly supported.

5.7 Conclusions and lessons learned

The case studies in this research indicate that methodologies for defining CMLs should abandon an exclusive focus on biophysical risk modelling and adopt a more holistic, integrated, and interdisciplinary approach that incorporates socio-economic, cultural, political, and ecological considerations. In the case of Cape Town, the socio-economic disparities along the coast are vast and poverty reduction is imperative. It is therefore critically important to expand conceptions of the environmental agenda so that the relationship between sound environmental management and poverty alleviation is better understood (Parnell et al., 2007; Leck et al., 2011) and to promote an inclusive approach that involves reflexive deliberation, participation and negotiation. Achieving a more expansive and cross-disciplinary approach in turn is dependent on an enabling process that creates space for engagement between various disciplines as well as encouraging dialogue between governing sectors and the public in respect of defining CMLs (Chapter Six provides an analysis as to why it is difficult to create spaces for collaboration between government and civil society beyond the formulation of CMLs).

Negotiation can be a powerful tool to mobilize community involvement around social and environmental issues. Conflicts are bound to arise, but through negotiated conflict resolution, a better understanding of the interests and values of the social, economic and environmental proponents will emerge. It is this enhanced understanding that should inform planners in their pursuit of more sustainable forms of development. Ideally the process should seek to reconcile opposing values and goals through actions that achieve multiple values simultaneously and result in synergistic influences and outcomes (Kates et al., 2005). As the CCT undertook the determination of the CML internally over a period of four years, the CMB was positioned to work through and negotiate the conflicting interests arising from proposed CMLs, and thus define a CML that represented a range of socioeconomic, political, and environmental interests.

Adopting a process that enabled an extended period of time and the ensuing dialogue with I&APs also sensitized officials within the CMB to externalities surrounding the delineation of CMLs. In the case of Monwabisi, these externalities manifested as the social and political construction of the environmental agenda, where the CML came to represent values associated with South Africa's past of exclusion and separation. Defining a CML methodology based on the outcomes of sustained dialogue and negotiation

with I&APs and affected parties yielded a people-centric rather than techno-centric CML. This outcome, however, depended on the CCT engaging in a process that enabled reflexive learning, which in turn shaped the CML methodology. The period available for negotiation and dialogue in the case of the ODM was limited to six months. This time restriction resulted in a process that did not enable meaningful dialogue with I&APs and affected parties or consider local values and socioeconomic interests, but instead focused on biophysical considerations. Furthermore, the determination of a Coastal Management Lines based on a complex modelling methodology alienated I&APs and affected parties because it was difficult for them to understand. This technical approach generated uncertainty and confusion and ultimately resulted in the CML being legally contested and not accepted. Applying a fixed, one-dimensional CML, determined solely according to an empirical analysis of biophysical risk illustrated on a map, creates an asymmetry of space. This asymmetry occurs when a static and socially constructed space is overlaid with a relational space characterized by fluid socioeconomic, political, and environmental connectivity. This in turn produces a management disjuncture, where the CML is used to promote and manage more sustainable forms of coastal development, even though empirically oriented CMLs downplay and underrepresent the complexity inherent in coastal development and risk management.

This research has indicated that the application of CMLs based purely on empirical modelling is reductionist and runs the risk of taking coastal management back to an approach that is fragmented and limited to the natural sciences. Such fragmentation is a consequence of sectoral management approaches, although not in an institutional sense, but rather in a disciplinary sense, when the science of CML determination is led by the discipline of coastal engineering (see section 7.3.4 of Chapter Seven which summarizes the link between the consulting engineering industry, 'mode 1' knowledge production and the powerful influence this mode of knowledge has within the coastal risk and vulnerability domain).

The research described in this article reveals that the determination of CMLs cannot be limited to any single discipline, but should rather be informed by various disciplines and knowledges across both the natural and the social sciences. Broad scale engagement and deliberation with I&APs also enables the merger of scientific, practitioner, and community-based knowledge. This is fundamental toward grounding knowledge within the realities of

developing city-scale contexts and, in turn, defining CMLs that are inclusive and effective. The experience in ODM and the CCT demonstrates the need to look beyond the natural science discipline and be more inclusive of societal elements in developing CMLs. Indeed, the Provincial government responsible for funding and managing the process of defining CMLs, having learned from the ODM experience, will be placing greater emphasis on stakeholder engagement in determining a CML and associated regulations for the next coastal municipality. This engagement will focus on a bottom-up approach: instead of prescribing a technocratic approach to managing risk, I&APs will be encouraged to engage and give input into both defining a CML and shaping the content of supportive coastal regulatory mechanisms (Bekko, personal communication, July 5, 2013). Although recent studies have stressed the importance of an integrated approach to managing coastal development that incorporates aspects other than physical coastal processes in defining CMLs (Mather, 2007; Schoonees et al., 2008; Theron & Rossouw, 2008; Smith, 2010), there is limited literature on the practical incorporation of social, cultural, economic, political, and broader environmental elements in addressing risk associated with sea-level rise, coastal erosion, and shoreline management more broadly. Developing CMLs in a manner that acknowledges the coast as a coupled and indivisible system will require a paradigm shift in the current techno-centric master narrative surrounding CML determination in South Africa. The experiences of the both the CCT and the ODM in the establishment of CMLs have revealed a number of key insights and lessons. Based on these insights, this research has identified a set of principles and guidelines that are considered central to the process of defining an effective CML. These are presented below.

Principle 1: Holistic and Integrated Approach

- The coast must be acknowledged as a complex and connected space, where social, cultural, economic, political, and ecological systems are inherently linked.
- Planning and decision-making need to take account of the multiple interests, needs and values of all I&APs and affected parties.
- Coastal Management Lines must be developed in a way that promotes their integration into locally developed land-use planning and building regulation schemes.
- Coastal Management Lines in isolation are ineffective where existing infrastructure is at risk and thus require additional supportive planning mechanisms that are more equipped to manage the complexities of this risk.

Principle 2: Inclusivity and participation

- I&APs and affected parties must be involved from the inception of the initiative of defining a CML.
- The process of formulating a methodology for the delineation of CMLs must create space and enable sufficient periods of time to promote sustained dialogue with I&APs and affected parties.

Principle 3: Interdisciplinary approach

- Coastal Management Line methodologies must draw on information and seek understanding from a range of disciplines and perspectives.

Principle 4: Co-production of knowledge

- The process must recognize and respect different knowledges and seek to integrate them into CML determination.
- Engagement must provide a platform that stimulates the co-production of knowledge whereby community, practitioner, and scientific knowledge form the basis of determining a methodology in defining a CML.
- The process must recognize and respect different knowledges and seek to integrate them into CML determination.
- Engagement must provide a platform that stimulates the co-production of knowledge whereby community, practitioner, and scientific knowledge form the basis of determining a methodology in defining a CML.

Principle 5: Responsiveness, Flexibility, and Adaptiveness

- Given the complexity of the coastal environment, a one-size-fits-all approach is not feasible. Thus local contexts require local methodologies to be developed.
- Coastal Management Lines may need to change as conditions change. Thus there is a need for a review and process of adaptation that is responsive to changing conditions. These include both socioeconomic and biophysical conditions.

Principle 6: Shared Responsibility

- The development of CMLs to manage risk must be founded on a collectively determined resolution between authorities, private sector, and civil society.
- Attention must be given to building long-term partnerships between state and civil society to empower participants and enable shared responsibility.

Principle 7: Risk-Averse and Precautionary Approach

- The precautionary principle and planning for uncertainty must be applied when defining CMLs.

Principle 9: Practicality and Simplicity

- The coastal zone is a complex space. Thus both the methodology for determining CMLs and the process of engagement need to be practical and simple.

Principle 10: Accountability and Transparency

- Information and governance processes must be directly accessible to I&APs and affected parties.
- Mechanisms must be in place to ensure decision makers are able to account for and take responsibility for their decisions.

Principle 11: Capacity Development

- Training and capacity development that address the theory and application of the above principles and guidelines are required.
- The capacitation of municipalities must be seen as the preferred alternative, because with capacitation comes both institutional memory and increased local knowledge.

Finally, the application of Campbell's (1996) conceptual framework has been useful in understanding the challenges that planners face in pursuit of more sustainable forms of coastal development. Framing coastal risk management against the concept of the Planner's Triangle has enabled the identification of a range of important facets and processes that need to be considered in the course of delineating CMLs. This research has revealed that these facets and processes not only challenge existing conventions of best practice in terms of defining CMLs, but are non-negotiable if CMLs are to become more affective at promoting sustainable and risk averse development at the local level. Campbell (1996) argues that while the centre point of sustainability may be achieved through sustained periods of confrontation, negotiation, and conflict resolution, this centre point cannot be reached directly but only approximately and indirectly. Similarly this research has revealed that while CML methodologies have no alternative but to pursue this balance, there are localized biases that arise out of negotiations with local stakeholders toward any one of the social, economic, and environmental dimensions.

The challenge for municipal planners is to ensure that these localized biases collectively achieve an approximate balance at the broader municipal level and that risk aversion is built into this balance.

Chapter 6:

**Dissonant discourses:
revealing South Africa's
policy-to-praxis challenges in
the governance of coastal risk
and vulnerability**

This chapter is a minor revision of the article:

Colenbrander D.R. (in press). Dissonant discourses: revealing South Africa's policy-to-praxis challenges in the governance of coastal risk and vulnerability. *Journal of Environmental Planning and Management*.

6.1 Introduction: from government to governance and South Africa's Coastal Vulnerability Dilemma

In urban and peri-urban hubs such as cities, a significant proportion of sea-frontage property falls within the ownership of the private sector. The loss of, or damage to, property from coastal hazards such as storm surges and erosion has negative impacts on the livelihoods of these property owners (Theron & Rossouw 2008; Sowman et al., 2016). These impacts may range from uncertainty about the future, negative health impacts on owners whose properties are exposed to coastal hazards, socio-economic blight of coastal communities and strained relations between property owners vulnerable to coastal hazards, and the state (Cooper & McKenna, 2008). Responses to storm surge and coastal erosion may also generate 'knock-on' impacts that manifest across a wider socio-economic spectrum generating both 'winners' and 'losers'. For example, conventional sea defence structures such as sea walls may protect individual properties, but such defences may also result in the loss of beaches as valuable recreational and tourism spaces, and thus a broader economic and socio-cultural loss to cities (Pilkey & Cooper, 2014; Cartwright & Morgan, 2016; Fitchett et al., 2016, Sowman et al., 2016). Here the phenomena of coastal erosion becomes 'wicked' in that solutions in themselves may 'generate waves of consequences over an extended – virtually and unbounded – period of time' (Rittel & Weber, 1973, p. 163). Wicked problems are also characterised by the difficulty in definitively defining the problem (Rittel & Weber, 1973). The 'wickedness' that surrounds coastal erosion is evident in South Africa and, for purposes of reference, is referred to as the Coastal Vulnerability Dilemma (CVD). A prominent feature of the CVD in South Africa is the state's deliberate avoidance of engaging with vulnerable property owners exposed to coastal hazards despite such a stance compounding risk and vulnerability. This paper elaborates further on this aspect when discussing the CVD in more detail in Section 6.2.

In responding to wicked problems such as the CVD, Interactive Governance theory advocates that a shift from government to governance is necessary, where traditional, hierarchical modes of governing by government give way to modes that are characterized by two-way processes of government-society interactions (Kooiman & Jentoft, 2009; Lockwood et al., 2010). Here 'co-governance' modes require that the whole of public and private interactions are used towards solving societal challenges and creating societal opportunities, the intent of which is to find consensual solutions amongst all governance actors (Bavinck et al., 2005). A key element that determines the success of this mode

is that processes of engagement between the state and civil society are *equitable* and *procedurally fair* (Bavinck et al., 2005). The emphasis on procedures that are fair – or procedural justice – is especially pertinent to the South African context, given its divisive and exclusionary past under the apartheid regime. It is for these reasons that principles of co-governance have been enshrined within The Constitution of the Republic of South Africa (published in 1994); (hereafter referred to as ‘the Constitution’) and national coastal policy: the White Paper on Sustainable Coastal Development (hereafter referred to as ‘the Policy’) which was published in 2000.

Despite this, and despite South Africa’s transition to a democratic state 20 years ago, there is an increasing polarity between the state and civil society in relation to the governance of coastal risk and vulnerability. It is within this context that this chapter provides a response to sub-question five presented in section 1.4 of Chapter One, namely: ‘How do modes of governance influence the effectiveness of governing coastal risk at the local level?’ Based on this question this article is structured in the following format: Section 6.2 provides a theoretical perspective on coastal vulnerability, procedural justice and co-governance. Section 6.3 details the background and context of the case study. Section 6.4 gives a description of Argumentative Discourse Analysis (ADA) as the methodological framework used for this chapter. Section 6.5 presents the findings in the context of wider literature and what this means for the governance of coastal risk and vulnerability in South Africa. The conclusion is presented in section 6.6.

6.2 Coastal vulnerability, procedural justice and co-governance

6.2.1 South Africa’s Coastal Vulnerability Dilemma

In line with international trends, research in the province of KwaZulu-Natal reveals that the highest rate of urban development is taking place within a 100 m strip of the coastline - a crude proxy for exposure to risk from coastal hazards (Cilliers & Groenewald, 2012). Earlier research made the findings that this coastal development in KwaZulu-Natal consists primarily of privately owned residential properties (Hughes & Brundrit, 1992). In Cape Town, the largest coastal metro in South Africa in terms of both population (approximately four million) and sea frontage (240 km/149 miles),⁶² 75% of

62 This figure represents the length of coast over which the city has administrative jurisdiction over. In total, the length of Cape Town’s coastline is estimated at 307 km; the extra 67 km comprising the Table Mountain National Park, as managed by South African National Parks.

the coastline is developed within 100 m of the high-water mark. As with the KwaZulu-Natal case study, a significant proportion of this sea-frontage property is privately owned (Colenbrander & Bavinck, 2016). A sea-level rise risk assessment undertaken in 2008 estimated that approximately 25 km² in land surface area adjacent to the sea is at high risk to storm surge induced flooding within the next 25 years (Brundrit, 2009). A particularly vulnerable section of coast within Cape Town – measuring 2 km in length – has receded by approximately 100 m over the last century (Brundrit, 2016). Along this stretch of coast there are approximately 1045 private properties (the majority of which are zoned residential) at risk to coastal erosion and flooding. The collective value of these properties is estimated at R2.08 billion (Cartwright & Morgan, 2016).

Although climate change induced coastal hazards present a significant and escalating risk, the coastline continues to attract significant investment and development opportunities. This is due mainly to the allure of sea-frontage property as a means towards achieving economic wealth and gain, especially within the context of South Africa's neo-liberal economy (Houghton, 2010). In addition to the high value and profitable returns of owning and investing in coastal real estate, the coastline offers significant opportunity to address South Africa's exclusionary past⁶³: coastal development is perceived as a conduit from which to promote economic emancipation and livelihood upliftment (National Department of Planning, Monitoring and Evaluation, 2017). These socio-economic and political drivers in South Africa are all contributing to the phenomena commonly referred to as 'coastal squeeze': increasingly utilized and developed coastlines in the face of advancing sea-level rise, storm surges and coastal erosion (Sterr, 2008; Scott et al., 2012; Doody, 2013).

In recognition of these mounting pressures and the need to better govern the coastal space, South Africa promulgated its first principle coastal legislative framework in 2009, the Integrated Coastal Management Act (ICMA) (Act No.36 of 2014 as amended)⁶⁴. The ICMA allocates responsibility to the state

63 Under South Africa's apartheid regime and regulated by the Group Areas Act, certain beaches were reserved for the exclusive use of white South Africans while less favourable areas were reserved for black South Africans. Similarly, white communities benefited from coastal development in desirable areas.

64 The ICMA was originally legislated into law on the 1st December 2009. Before it was amended it was referred to as the ICMA (Act No. 24 of 2008).

for the governance and care of the coastal zone. Strategically the ICMA also contains provisions that absolve the state from any liability,⁶⁵ financial or otherwise, from private property owners that may be vulnerable to coastal hazards (DEA, 2014). The burden of responsibility of responding to coastal risk and vulnerability is thus placed exclusively on the shoulders of vulnerable property owners as a key actor group within the coastal risk and vulnerability domain (see Section 4 for more details on actor groups).

The legislated abnegation of responsibility by the state also provides no reason for the state to promote proactive and discursive engagement with vulnerable landowners at the required scale⁶⁶. The subsequent lack of guidance by the state to property owners on how to respond to coastal hazards isolates and disempowers them as a group of actors. Despite being generally affluent, vulnerable property owners by and large lack sufficient financial recourse⁶⁷ to establish defence structures at the required scale to adequately and sustainably protect their property from coastal hazards. Defence interventions, as a consequence, remain ad hoc, ill-informed, of poor quality and piecemeal. This, in return, amplifies coastal risks across a wider socio-economic spectrum. This is evident through the degradation and/or loss of beaches as democratic public spaces, with the general beach-going public being the biggest loser (Colenbrander et al., 2012, Fitchet et al., 2016). In this regard the provisions contained in the ICMA may be viewed as contradictory: the state cannot play a central role in coastal governance yet absolve itself from one of the most pressing coastal challenges facing South Africa today: that of increasing exposure of communities and properties to climate change induced coastal risk.

The ‘wickedness’ of the CVD is contributed to by a multiplicity of environmental, political, social and governance drivers: these include contradictions in the ICMA and governance deficits through the absolution of the state from coastal risk, historical planning and development decisions that have underestimated the reach of coastal hazards, the lack of sufficient

65 Provided that the state does not contribute to or cause coastal erosion.

66 Communication between the state and vulnerable property owners is limited to a reactive compliance directed at individual property owners and/or individual body corporates (see Section 3.3). Such an approach is considered myopic in that coastal hazards span geographical scales that far exceed the boundary limits of individual properties (Brundrit, 2016).

67 For a two-kilometer stretch of coast in Cape Town, it was estimated that R75 –R100 million was needed to establish protective measures against coastal erosion (Smith Ndlovu Summers, 2016).

financial recourse to fund more appropriate defence interventions or alternative adaptation strategies (such as retreat), neo-liberal capitalist driven economies and climate change induced sea-level rise and storm surges all conspire to form, and sustain, the CVD. Each of these in return has their own complex causal pathways, making both the cause of the problem, and the problem itself, difficult to define and understand. ‘Solutions’, such as hard engineering defence structures used to protect vulnerable properties, are in themselves also creating other problems which are manifesting across wider spatial and temporal scales (Colenbrander et al., 2012).

6.2.2 Procedural justice and co-governance

The isolation of vulnerable property owners by the state and the escalating tensions and risks associated with the CVD brings procedural justice into sharp focus. Procedural justice is concerned with encouraging legitimate and inclusive engagement with stakeholders who have the right to be recognized in political and governance processes (Haldemann, 2008). Its value is recognized from the perspective that it gives legitimacy to governance actions in achieving socially-just outcomes and ultimately long-term sustainability (Jentoft, 2013; Shi et al., 2016). Schlosberg (2003) suggests that inclusive and authentic participation is necessary for developing and maintaining a participatory democracy. Policy, and policy instruments intended to shape governance approaches that are informed by inclusive and authentic processes of engagement, are more likely to receive buy-in and thus support (Novak, 2000; Barry, 2005). Conversely, procedures of engagement that are perceived not to be inclusive of stakeholder interests, are likely to be challenged as they are seen as unfair and unjust (Barry, 1995; Marinnet, 2005). Thus, procedural justice is essential not only to participatory democracy, but makes for more effective governance.

South Africa’s transition to democracy has required that government commits to principles of procedural justice. This commitment is enshrined in a number of seminal South African legislative frameworks including the Constitution as well as the Promotion of Administrative Justice Act (PAJA)(Act No. 3 of 2000). Statements such as ‘Everyone has the right to administrative action that is lawful, reasonable, and procedurally fair’ (Constitution of the Republic of South Africa 1994, p. 13) and ‘To give effect to the right of administrative action that is lawful, reasonable and procedurally fair...’ (Promotion of Administrative Justice Act, 2000, p.1) are clearly demonstrable of this. The ability to promote principles of procedural justice in practice is closely linked

to governance: particular governing modes may be more or less effective at enabling procedures that are fair, transparent and inclusive (Scholtens & Bavinck, 2013). In recognition of this, it becomes pertinent in the context of this article to explore the link between procedural justice and governing modes in more detail.

Interactive Governance theory (see Kooiman, 2003; Bavinck et al., 2005 for a broader overview) considers governance modes as the institutional arrangements that are put in place to achieve normative governance goals, such as promoting procedural justice. Within the Interactive Governance framework, three modes of governance are identified, namely hierarchical, self- and co-governance (Kooiman, 2003). Hierarchical governance modes are characterized by state-centric systems where government is located at the apex of the pyramid generating top-down, 'command-and-control' orientated governance approaches. Self-governance takes place when governance is decentralized to form an autonomous steering function. Co-governance refers to the scenario whereby there is close collaboration between various governance actors, in particular across the state/civil society divide (Chuenpagdee & Jentoft, 2013).

Each mode of governance carries with it strengths and weaknesses. Thus different contexts require different, or a combination of, governance modes. For example, hierarchical modes of governance tend to be dependent on bureaucratic structures and standardized procedures, both of which are considered to be less effective in responding to change (Bavinck & Kooiman, 2013; Colenbrander & Bavinck, 2016). In complex and dynamic governance settings, hierarchical modes of governance may be less effective than self-governance modes, which are considered more fluid and sensitive to change (Scholtens & Bavinck, 2013). Co-governance recognizes that complex or 'wicked' problems can no longer be the exclusive purview of government alone. The more complex and wicked a governance problem is, the more difficult it becomes for government to work in isolation (Kooiman & Bavinck, 2013). Here co-governance recognizes the value in departing from hierarchical, regulatory and technocratic approaches, led by 'government', to more inclusive modes of 'governance' defined by state-society interactions (Lockwood et al., 2010; Kooimann & Jentoft, 2009). Through promoting inclusivity, co-governance enables a better framing of a governance challenge through promoting engagement with a wider spectrum of affected actors, each with their own unique insight and perceptions of what the problem may

be (Scott et al., in press). Co-governance also enables *procedural fairness* giving legitimacy to governance actions and it is for these reasons that co-governance is being explored in more countries⁶⁸ in both the north and the south (Jentoft, 2013). It follows then that governance interventions to address challenges such as the CVD should only take place if the process in which interventions are formulated are inclusive and that the outcomes are considered socially just (Bulkeley, 2001; Oelofse et al., 2006; Renn et al., 2011; Sen, 2011; Jordan & Benson, 2013; Song et al., 2013).

Co-governance is, however, not without its own challenges. Power differentials amongst the various actors may increase the scope for marginalisation and manipulation to meet the needs of individual or group agendas leading to inequitable outcomes (Glavovic, 2013a; Buchy & Maconachie, 2014). Modes of co-governing have also been conceived as idealistic, stemming from the difficulties of engaging with citizens in ‘authentic, discursive processes in a world characterized by *inter alia* inequity, divergent dialogical competencies, *dominant government processes* [emphasis inserted] and ruling elites’ (Glavovic, 2013a, p. 938). Here, dominant government processes become of interest because such processes can be obstructive to resolving particular governance challenges (Glavovic, 2013a).

6.3 A brief history: South Africa’s transition to democracy and the emergence of an inclusive coastal governance paradigm

6.3.1 A new democracy and South Africa’s first coastal policy

South Africa’s transition to democracy in the early 1990’s signalled the emergence of a new political ‘truth’ and the subsequent emergence of people-centric and pro-poor discourses (Sowman, 1993; Glavovic, 2006). Following from this transition, the South African government in 1997 undertook an extensive and inclusive process of public participation research and analysis to develop South Africa’s first coastal policy, the White Paper for Sustainable Coastal Development (DEAT, 2006). Emulating the spirit of South Africa’s new found democracy, the formulation of the Policy was based on the active participation of over 5,000 people from all tiers of government, civil society and the private sector (DEAT, 2006).

68 Principles of co-governance, such as involving stakeholders in regulatory decision-making, consultations with stakeholders and the delegation of management responsibilities are now central tenets of the European Union common fisheries governance reform programme (Jentoft, 2013).

The spirit of inclusivity and a shift to participatory democracy in governance decision making is evidenced by the following quote by the then minister of the Department of Environmental Affairs and Tourism: ‘Government, civil society and the private sector have worked together to formulate this Policy and will need to continue working together, as partners, to implement it’ (DEAT, 2000, foreword). As with Interactive Governance and the value ascribed to co-governance, so too does the Policy emphasize the value of this mode of governance: ‘International and local experience of coastal management shows that it is most effective when government adopts a co-operative style of management in which *responsibility is shared* [emphasis inserted] between different spheres of government and a range of other stakeholders, including business and civil society’ (DEAT, 2000, p. 24). The following extract from the Policy affirms the emphasis on co-governance and participatory democracy as key principles to be upheld in the coastal governance arena.

A word count (Table 6.1) reveals a dominant policy vocabulary orientated towards ‘participation’, ‘partnerships’ and ‘co-responsibility’.

Text box 1: Extract from South Africa’s White Paper on Sustainable Coastal Development revealing policy vocabularies of ‘co-governance’ through various goals and objectives (DEAT, 2000, p. 53)

Public Participation, Partnerships and Co-responsibility

Goal A1: To ensure meaningful public participation, and to promote partnerships between the State, the private sector and civil society in order to foster co-responsibility in coastal management.

Objective: A1.1 There shall be meaningful public participation in all coastal planning and management efforts.

Objective: A1.2 Organs of State shall proactively seek to develop partnerships with the private sector, civil society and the research community in coastal planning and management.

Objective A1.3 A caring and responsible attitude to the coast shall be encourage amongst all coastal resource users to foster co-responsibility for its management.

Table 6.1: Dominant policy vocabularies contained in the White Paper on Sustainable Coastal Development

Term	Definition	No. [#]
Public Participation	A process whereby <i>stakeholders</i> contribute to public decision making.	13
Public – private partnerships	Partnerships developed between government, civil society and business and industry.	12
Co-governance [†]	Partnerships between government, the private sector and civil society must be built in order to ensure co-responsibility for coastal management and to empower stakeholders to participate effectively.	13

[#] Denotes the number of times the particular phrases are mentioned in the Policy.

[†] The term “co-governance” was used, as “co-responsibility” was not defined in the Policy.

In converting this policy rhetoric into praxis, an Integrated Coastal Management Bill was made available for public comment in December 2006. After numerous iterations, the Bill was legislated on 9 December 2009, forming the ICMA (Act 36 of 2014). As the Policy instrument, the ICMA represents South Africa’s first legislative framework and tool dedicated towards the management and regularization of the coastal zone, and achieving the objectives of the Policy (DEAT, 2006).

6.3.2 Lost in translation: have the principles enshrined in the White Paper on Sustainable Coastal Development been upheld in the Integrated Coastal Management Act?

It appeared that the process of developing the ICMA as the Policy instrument was dominated by the state, in particular by national government and that the principles enshrined in the Policy, particularly as it relates to co-governance, were not adequately incorporated into the Bill (Glavovic, 2006). Reasons for this remain unclear and speculative, but appear to be linked to the desire to consolidate and concentrate power in national government by limiting public sector influence in decision making within the coastal governance arena (anonymous, 1st August, 2017). Glavovic (2006, p. 901) notes that before the ICMA was signed into law, the Bill (draft Act) ‘concentrates power in the national Minister, necessitates the introduction of a slew of regulations and cuts out many of the most important innovations introduced in the initial version of the Bill’. Whilst some innovations, such as coastal committees, have been legislated in the ICMA and which are designed to enable and facilitate co-governance as advocated in the Policy, the functioning of these committees remains largely superficial in terms of their original intent. This assertion is discussed and demonstrated in Section 5.1. Glavovic (2006, p. 901) also recounts that: ‘Some coastal specialists fear that South Africa may

be returning to an earlier era when the views of many coastal stakeholders were marginalized, and centralized control and regulation dominated Government's coastal management efforts. It will be a travesty if Cabinet eventually approves coastal legislation that is a mere 'shell' of the White Paper'.

The Integrated Coastal Management Act today: through the lens of risk and vulnerability

The ICMA attempts to address a wide range of coastal challenges in South Africa. The more salient activity-based challenges include the prevention of the privatization of the coast in the interest of the broader public, protection of sensitive coastal ecosystems from harmful activities, prevention of pollution and the regulation of the use of vehicles in the coastal zone (DEA, 2014). The ICMA also recognizes the inherent dynamism of the coastal space and the risk that such a dynamic space presents to development and infrastructure abutting the coast. Further, the impacts of a warming climate, such as sea-level rise, more intense storms, shifting wind regimes and the trend in coastal development has resulted in specific provisions that attempt to regulate and manage this development. For example Sections 14 and 15 of the ICMA state that if the position of the high-water mark moves landward of a property boundary – typically due to sea-level rise, storm surges and coastal erosion – the property seaward of the high-water mark becomes Coastal Public Property⁶⁹ (CPP) and is no longer owned by the affected property owner. Secondly, and as per Section 15 of the ICMA, any owner of a property that is exposed to coastal erosion, provided that such erosion is not caused by an organ of state, is not entitled to request any sphere of government in South Africa or any other person to take measures to prevent erosion for the protection of their property (DEA 2014). Thus the *responsibility* for responding to, and resolving property loss and exposure to coastal hazards, is placed exclusively on the 'shoulders' of the individual property owner, or in the case where exposure is more widespread, communities, to resolve.

If Sections 14 or 15 of the ICMA are contravened - for example through erecting or maintaining defence structures that fall on CPP, or where such structures prevent erosion or accretion without conducting relevant studies and obtaining an Environmental Authorisation in terms of the National

⁶⁹ Coastal Public Property is State land that is vested in the interests of the general public and falls under the protection of ICMA.

Environmental Management Act (Act 107 of 1998)⁷⁰ - punitive and/or corrective measures may be enforced by the state. The ‘language’ contained in the provisions of the ICMA as it relates to coastal risk and vulnerability differs markedly from the vocabularies contained in the Policy. There is a significant shift in language that focuses on ‘co-governance and ‘public-private partnerships’ that underpins the Policy to a diametrically opposing ‘regulatory’, ‘top down’ and ‘punitive’ language, as contained in the provisions of the ICMA in relation to coastal risk and vulnerability. Indeed, the only current method of communication between the state and public sector in relation to risk and vulnerability is through serving formal coastal protection notices in terms of Section 59, which is essentially an instructive mechanism. Box 2 reveals both the intent of the coastal protection notice and the nature of the language used in a Section 59 notice.

Text box 2: Extract from the ICMA as it relates to the states approach in communicating with persons that are suspected of contravening the ICMA (DEA, 2014, p. 79)

Section 59: Coastal protection notice and coastal access notice:

- a. Prohibiting the activity if it is not already prohibited in terms of this Act; and
- b. Instructing that person-
 - i. to take appropriate steps in terms of this Act or any other applicable legislation to protect the environment;
 - ii. to investigate and evaluate the impact of an activity of an aspect of the coastal environment in accordance with Chapter 5 of the National Environment Management Act; or
 - iii. to skip or postpone the activity for a reasonable period to allow the investigation to be carried out and for the Minister or MEC to evaluate the report.

⁷⁰ Environmental authorization is required from the competent authority (Provincial Department of Environmental Affairs and Development Planning) should certain listed activities take place within the coastal zone. This authorization is required to better regulate potential harmful activities in the coastal zone.

The discourse of ‘participatory democracy’ of the early 1990s, although replicated in the Policy, is non-existent in the ICMA in terms of governing and regulating coastal risk and vulnerability⁷¹. It is acknowledged that the language contained in the ICMA will naturally shift to meet the needs of a language necessary for law, as opposed to policy texts that serve a different purpose. Despite this, and as Section 5 reveals, a hierarchical mode of governance prevails within the coastal risk and vulnerability domain in South Africa.

6.4 Methodology: determining governance modes by means of an Argumentative Discourse Analysis

Argumentative Discourse Analysis, as a specific theory of discourse analysis, is derived from the field of ‘interpretive policy analysis’ in political science (Scott, 2017). This theory advocates that policy formulation is founded on, and shaped by, argumentative processes. ADA applies the notion that argumentative processes take place in discussions and meetings as actors position themselves in relation to a particular ‘burning’ issue (Scott, 2017). Here, these argumentative discussions may be seen as political in that one actor or actor group may seek to advance one particular discourse over another and thus dominate decision and policy-making processes (Scott, 2017). Argumentative Discourse Analysis aims to reveal ‘a dominant political ‘truth’ that, in turn, legitimizes societal intervention strategies by means of policies and policy instruments’ (Winkel et al., 2016 quoted in Scott, 2017, p. 13).

In the context of this research, ADA is applied to identify prevailing discourses in various actor groups and how such discourses may shape ‘governance modes’ (as representative of a societal intervention) in responding to coastal risk. This research distinguishes between two main actor groups, that of government (the state), consisting of national⁷², provincial⁷³ and local⁷⁴ government, and that

71 Whilst some stakeholder engagement has been undertaken by the state in relation to risk and vulnerability, such engagement has focused primarily on informing coastal communities where hazardous areas are located along the coast. This has been undertaken through various state initiatives of implementing coastal management lines and determining vulnerability indices. There, however, remains little evidence of engagement by the state with the private sector who are currently vulnerable to coastal risk in terms of how to respond to such risks and limit their own vulnerability.

72 National government, as per Section 85 of the Constitution of South Africa, is tasked with the development, implementation and regulation of laws and policies at a national scale (Goble et al., 2014).

73 Provincial government, as per Section 155 of the Constitution of South Africa, is tasked with the regulation and enforcement of national legislation and to provide a supportive role to local government within each of the countries nine provinces (Goble et al., 2014).

74 As per Section 156 of the Constitution, local government is responsible for the management of beaches (Goble et al., 2014).

of the private sector, consisting of private property owners exposed to coastal hazards. To contain the scope of this research, beach users - representing the general public - were not included in this analysis.

Data for this ADA has been drawn from discursive materials. Main texts include: i) policy documents (National White Paper on Sustainable Coastal Development) and the policy vocabularies contained therein; ii) legislative frameworks as policy instruments (National Environmental Management: ICMA); iii) meeting minutes from discussions held between the two actor groups; and iv) surveys commissioned by the City⁷⁵. Data also includes dialogues – or speech acts – gathered from email correspondence and personal communications between the different tiers of government as well as between government and the private sector.

6.5 From policy promise to policy failure: revealing a state-centric governance mode in the coastal risk and vulnerability domain

The priority of promoting collaborative coastal governance between the state and private sector in South Africa is reflected in Goal A1 of the Policy: ‘To ensure meaningful public participation, and to promote partnerships between the state, the private sector and civil society in order to foster co-responsibility in coastal management.’ The intent of this section aims firstly to determine the state’s progress in achieving Goal A1 of the Policy. Secondly this section seeks to determine what mode of governance prevails in South Africa today in the coastal risk and vulnerability domain.

6.5.1 Determining the states progress in promoting co-governance: through the lens of coastal committees

To give legitimacy and traction to the goals and objectives contained in the Policy as it relates to co-governance, the Policy made provision for the establishment of coastal committees. The establishment of these committees have been legislated⁷⁶ in the ICMA which acts as the Policy instrument. The intent of these committees is to foster dialogue between coastal governance actors - in particular between the state and civil society - to encourage participatory democracy, procedural justice in decision making and ultimately to achieve Goal A1 as set out in the Policy (DEAT, 2000; DEA, 2014). Thus the representation of the private sector

75 The surveys commissioned by the City were undertaken to better understand the nature of relationships between governance actors within the coastal risk and vulnerability domain.

76 In terms of the legislative provisions of ICMA, it is mandatory for national and provincial spheres of government to have coastal committees, whereas with local government it is optional.

on these committees is considered a proxy for the states progress in achieving those goals contained in the Policy. Through a basic quantitative analysis, Table 2 provides a comparative overview of the representivity of state actors, non-state actors and the private sector – typically represented by ratepayer associations and/or councillors⁷⁷ on coastal committees.

Table 6.2: Representation of governance actors on coastal committees⁷⁸

Government sphere	No. of state entities[§]	No. of non -state entities (ngos, and business sector)	Research institutes	Private sector: ratepayer associations and councillors
National Government Coastal Committee	11	3	1	No
Provincial Government Coastal Committees [§]				
Northern Cape	19	7	0	Yes
Western Cape	12	4	0	No
Eastern Cape	21	5	4	No
KwaZulu-Natal	14	2	3	No
Municipal Government (metros) Coastal Committees [∗]				
Cape Town [§]	1	0	0	No
Port Elizabeth	9	2	0	Yes
Durban	5	9	2	Yes
East London [∗]	N/A	N/A	N/A	N/A

[§] This includes state owned corporations.

[§] The CCT does not have a Municipal Coastal Committee in term of ICMA, only an internal committee limited to CCT departments.

[∗] At the time of writing this article, a Municipal Coastal Committee had not yet been established in the City of East London.

Table 6.2 reveals that both non-state entities as well as the private sector are poorly represented on the National Coastal Committee (NCC). Instead, state actors dominate the NCC. Within provincial government, a similar trend is evident, with only the Northern Cape having representatives of the private sector on the Provincial Coastal Committee (PCC). Municipal Coastal Committees (MCCs), with the exception of Cape Town, reveal a more balanced representation inclusive of both non-state entities as well as by ratepayer associations and community representatives in the form of councillors.

⁷⁷ Councillors are political representatives for community interests.

⁷⁸ As of January 2017.

The figures presented in Table 2 indicate that there is greater representation with a wider spectrum of actors (beyond government) at the local level than there is at provincial and national levels. Coastal committees are the only formal institutional mechanism designed to facilitate co-governance, thus the legitimacy of such committees in promoting co-governance – and by extension procedural justice – at the national and provincial scale is brought into question. Given that national government is the locus at which coastal policy and legislation is formulated and which guides coastal governance in South Africa, the absence of the private sector from the NCC is indicative of a state-centric mode of governance. Whilst Goal A1 is reflected in the ICMA through the legislated requirement of coastal committees as mechanisms to promote co-governance, the poor representation of the private sector on these committees reveals that the state is failing to convert policy prescripts of co-governance into practice. Evidence of this failure is further demonstrated in the following section through the application of an ADA.

6.5.2 Revealing governance modes: through the lens of Argumentative Discourse Analysis

This section gives an analysis of the discourses held between the two main sets of governance actors, namely the state and the private sector as the second indicator of governing mode.

The state discourse: top-down, regulatory, punitive and compliance orientated

In a meeting held between senior representatives of the three tiers of government to discuss actions the state may take to address the erection and maintenance of sea defence structures by private property owners, a local government official commented:

I think the [issuing of a] pre-compliance⁷⁹ notice [in terms of Sections 14 and 15 of the ICMA] as a strategy for definite listed activity contraventions [installation of unauthorised sea defence structures] is a good one, because it starts sending the message to these people [property owners vulnerable to coastal hazards] and even if we don't follow through on it [issuing of compliance notices] as we have been discussing I think it is a really good strategy (18th June 2016).

79 A pre-compliance notice is used to give the landowner an opportunity to make representation and justify his or her actions.

This suggestion elicited the following response from another local government official: 'I think that is the right thing to do and as he said, it is a good strategy and it's a good warning, it's like a shot across the bow' (18th June 2016). The expression 'shot across the bow' originates from military parlance of firing, and causing, a small explosion in front of a vessel as a means to stop the vessel from proceeding. It is inferred that compliance notices should be used as a warning to stop property owners from continuing to erect and maintain defence structures to protect their property. Here, the provisions of ICMA, specifically Sections 14 and 15, are used as tools of intimidation through issuing compliance notices. The use of compliance notices as punitive mechanisms to effect behavioural change is similarly adopted by national government. In a separate meeting convened by the three tiers of government to discuss vulnerable property owners defending their properties, a senior national government official commented: 'I know if you go with a notice [serve a notice to property owners for illegal sea defence structures] you will put their backs up [provoke a hostile response]' (21st October 2016).

The punitive rhetoric exhibited by these quotes from senior government officials reveals an antagonism towards vulnerable property owners which is not conducive to co-governance. Similarly, the 'impersonal' form of communication through issuing notices as opposed to authentic, two-way-processes of engagement reveals as much. The isolation of the private sector is further amplified by the absence of this sector from coastal committees that should act as portals for engagement and negotiation between these two actor groups.

The state instead continues to issue compliance notices as the primary mode of communication with vulnerable property owners. A provincial government official noted:

So far we have issued a pre-compliance notice for the sand-bags [defence structures] that have been placed on the dunes, so that would be activity 18 and 19 in government notice 983 so that's the notice. In terms of the fencing we don't have delegation in terms of the ICMA as yet so national is dealing with that. We had a joint compliance inspection. With regard to compliance, the body corporate has responded and they have given representation, they provided some maintenance plan produced by [name of body corporate responsible for erecting defence structure not disclosed] (18th June 2016).

The term 'compliance' is frequently used by the official in describing the actions and sentiment towards the private sector. It is here that the argument is made that the isolationistic provisions of the ICMA are propagating a state discourse that carries with it a similar leitmotif to these provisions which ultimately manifests as heavy-handed state-centric governance actions.

Despite an acknowledgement by the state that a rigid application of legislation is unlikely to solve the CVD, the state persists with enforcing Sections 14 and 15 of ICMA on the basis that the state is mandated to uphold these provisions. A national government official commented: 'A practical solution is needed, legislation [the ICMA] on its own is not going to be assisting us much here' (18th August 2016). In response to this a provincial government official argued: 'The problem I fear here is that we do sit with legislation and we need to abide by that legislation [in addressing property owners protecting their property]' (18th August 2015). Although this statement reflects an awareness of the need to explore more responsive and collaborative ways of resolving the CVD beyond rigidly applying the rule of law, governance processes are bound to the regulatory order set by the ICMA. Further demonstrative of this, the Coastal Branch within the City of Cape Town Municipality (CCT) submitted a proposal to senior management requesting permission to initiate more authentic and discursive discussions with vulnerable property owners in resolving the CVD. A municipal official recounted the feedback from senior management within the CCT: 'We were, however, instructed [by senior management] to obtain a legal opinion. They [senior management] would not consider our proposal until a [legal] opinion had been done' (18th August 2016). The requirement of seeking legal opinion on provisions of the ICMA 'locks' the state into a matching mode of governance, where the state disassociates itself from coastal risk, yet applies a command-and-control approach in attempting to govern it.

Compounding the governance inertia towards exploring alternative modes in the resolution of the CVD is hesitancy on the part of the state to authentically engage with the private sector. In a debate surrounding the CVD at an NCC meeting, a legal representative from national government commented: 'national government does not want to set foot in that area [to engage with vulnerable property owners], it is very sensitive' (19th July, 2016). In an internal debate within local government, an official commented: 'My feeling is that these discussions [between local government and vulnerable property owners] should be held on an informal basis and used primarily

as information gathering sessions [for exploring solutions to the CVD]' (20th May 2016). Although reflecting an awareness that the current mode of governance applied by the state is problematic, this suggestion was met with the following response from an official within the same department: 'Suicidal?' (20th May 2016). As with national government, the term 'suicidal' is indicative of the fear held by local government in engaging with vulnerable property owners.

Whilst the discourse of the 1990s shaped a policy stance towards participatory democracy, the current hubris of the state discourse is reflective of a state-centric, hierarchical mode of governance and returns to the concern held by Glavovic (2006, p. 901) that 'South Africa may be returning to an earlier era when the views of many coastal stakeholders were marginalized, and centralized control and regulation dominated Government's coastal management efforts'.

The state's compliance and punitive discourse reveals rigidity in the application of the rule of law, as opposed to offering some flexibility towards engagement and finding a pragmatic and inclusive solution towards addressing the CVD. Here the application of legislation resonates with Novak's (2000, p. 1) assertion that legislation can become an 'instrument of ideological intimidation, for the purpose of gaining legal coercion'. Similarly, Hayek (1979) suggests that legislation can come to represent 'regulative principles of order' to manipulate power relations. The 'shot across the bow' analogy used by the local government official is demonstrative of this and signals intent by the state to control the actions of vulnerable property owners through the legislative provisions of ICMA.

The state's current mode of hierarchical governance and avoidance of participatory processes for enabling procedural justice is de-legitimizing actions by the state. This is perpetuating distrust between the state and the private sector. The expectation that there will be some form of backlash by the private sector in response to state initiatives to address coastal risk is now normalized within government. The breakdown in relations between the state and private sector primarily relates to perceptions by the private sector that the state's approach to governing coastal risk is 'top-down', exclusionary and procedurally unfair, rather than the private sector irrationally challenging or harbouring anti-government sentiment.

The private sector discourse: 'rights' and 'fairness through engagement'

The surveys commissioned by the City with the private sector revealed a discourse of 'rights' and 'fairness through engagement'. The surveys also reveal a growing frustration within the private sector in that their willingness to engage with the state to resolve the CVD is not being heard nor reciprocated by the state. In their attempts at seeking guidance from the state on how to respond to coastal hazards, the following statements reveal this frustration: 'The CCT does not respond to our emails', 'We don't know where to direct our concerns', 'the CCT is not prepared to help us' (Sowman et al., 2016, p. 51).

Language used by vulnerable property owners also conveys a sense of exclusion from the governance decision-making process led by the state: 'We need to be involved and not informed' (Sowman et al., 2016, p. 51) and 'people must be given the opportunity to speak' (Sowman et al., 2016, p. 55). The discourse held by the state and corresponding governance mode where there is no discursive or authentic engagement with property owners is considered unfair and antithetical to the rights of vulnerable property owners: 'They [the state] do not respect our rights'. The nature of these responses is suggestive of a governance mode that is not responsive to the needs of property owners and, as a consequence, is generating increased tensions and frustrations within this actor group: 'There is an underlying anger that is running through the community ... we feel bogged down [by the state]' (Sowman et al., 2016, p. 51).

The discourse held by property owners in the research commissioned by the CCT is re-affirmed in separate events beyond the commissioned research. One such event includes a joint initiative between the CCT and the Western Cape Provincial Government to investigate ways and means of protecting critical public infrastructure (rail and road) exposed to coastal erosion at a specific location in Cape Town. In voicing an opinion on the process followed by the state to identify an engineering intervention, a member of the public remarked: 'As always, so-called solutions and decisions are taken by people [government officials] who are not directly involved in the daily living situations' (13th October 2016). Implying that the state is non-transparent and exclusionary towards the public sector, members of the public lamented: 'However, we never know what happens behind the scenes of CCT decisions' (13th October 2016); and: 'Why are they [knowledgeable people in our community] and the collective voices [rest of the community] not being heard with regards to workable solutions?' (17th August 2017).

Even when undertaking formal public participation processes to give members of the public an opportunity to comment on decisions made by the state, there is a perception that such processes are merely a façade used to achieve state interests:

For the record: it is clear that this was yet another example of how public participation is merely seen by the city [CCT] as a tick-box exercise that needs to be done before what they want to do, inevitably happens. I am wondering what recourse we have and whether we can go to the media or some sort of ombudsman? (7th August 2017).

Another member of the public said:

Unfortunately, this just highlights the pointlessness of partaking in PP [public participation] if you are the public. Not once did we feel we were heard or taken seriously. This despite the fact that it is us who drive past and/or walk the beach every day in all weather (16th August 2017).

Another event reveals a similar discourse of ‘exclusion’ and ‘rights’. In a decision made by provincial authorities that approved a new development in a potentially risky area abutting the shoreline, a member of the public appealed this decision and in his response he stated: ‘As affected party we resent being ignored, marginalized and taken for granted. We ALSO have rights and coastal protection and restrictions and Coastal zones are made for a reason and should be removed only in very specific and exceptional cases’ (14th July 2017).

The sentiment held by the private sector clearly reveals a discourse of ‘rights’ and a desire of ‘fairness through engagement’ with the state. This storyline also reveals one of frustration emanating from ‘not being heard’, alienated from the state’s decision making and ultimately being disempowered by the state in their efforts at protecting their own livelihoods. Critically, this disempowerment is seen as a key contributory factor in intensifying the CVD.

Table 6.3: Summary of discourses and modes of governing between the state and private sector actors within the coastal risk and vulnerability domain

Governance actor	Discourse	Mode of governance and consequence	Actor interest and desired outcomes (position)
The state (national, provincial and municipal spheres).	Regulatory and compliance orientated. Focus on enforcement. Managerial approach that is top-down, command-and-control orientated. Reticent, punitive, formal and threatening.	Hierarchical: top-down, formal approaches through serving notices when the ICMA is contravened. Limited to no engagement with the private sector beyond serving notices. Inability to gain trust and 'buy-in', failure to implement important coastal strategies, poor relations with private sector.	Remaining legally compliant and upholding the provisions of ICMA. Avoidance of liability, consolidate and retain power.
Private sector: property owners and individuals vulnerable to coastal hazards.	Property rights, rights of fair and equitable engagement. Frustration with 'not being heard' excluded, alienated and disempowered. Decisions and actions by the state procedurally unfair and socially unjust	Self-governance: self-organization and decision making in isolation. Piecemeal and ad hoc interventions to defend properties that are ineffective and compound risk. Contraventions of the ICMA, poor relations with the state.	Procedural justice, authentic and open engagement with the state, protection of individual assets (property) and livelihoods.

Table 6.3 presents a state discourse and governance mode that is unresponsive to the needs and interests of vulnerable property owners. This mode is injurious to resolving the CVD as one of South Africa's most pressing coastal governance challenges.

6.6. Conclusion

Despite prominent vocabularies of co-governance contained in seminal South African legislative and policy frameworks (Constitution of the Republic of South Africa and South Africa's White Paper on Sustainable Coastal Development), this research has revealed that governance within the coastal risk and vulnerability domain remains strongly state-centric. The predominance of this mode of governance is demonstrated through two main indices, namely the poor representivity of the private sector on coastal committees (as the only existing platform from which to enable co-governance), and the dissonant discourses evident between the state and the private sector. The state discourse is revealed as one that is compliance orientated, punitive, regulatory and exclusionary, whilst the discourse held

by the private sector is oriented towards the need for equitable engagement, rights and fairness, not being heard, disempowerment and alienation. The discourse held by the private sector is, in itself, affirmatory of the state-centric mode of governance in the coastal risk and vulnerability domain.

Despite the ICMA being formulated as the instrument from which to achieve the Policy objectives, the isolationistic provisions contained within the ICMA in relation to coastal risk and vulnerability (and the state's mandate to uphold these provisions) is stimulating a state discourse which emulates the very nature of these provisions: regulatory, punitive, compliance orientated and exclusionary. Returning to the notion that dominant discourses may shape societal interventions to resolve environmental and societal challenges (Peyroux et al., 2014; Winkel & Leipold, 2016), it is argued that the discourse held by the state is, in itself, engendering a state-centric mode of governance (as reflective of a societal intervention). The implications of this mode of governance are significant in that it is polarising the state from the private sector. Given that the ability to make progress - in responding to wicked problems such as the CVD - is largely contingent upon procedural fairness and inclusivity (Jentoft, 2013), a state-centric mode of governance is considered as being both a contributory factor in creating and sustaining the CVD, and simultaneously antithetical to resolving it. Ultimately, the state's approach to governing coastal risk and vulnerability has become self-harming: it is de-legitimizing the state as a key actor in the coastal risk and vulnerability domain. The longer this mode of governance prevails, the more unlikely it is that the CVD will be resolved. This will, in return, have dire implications for coastal sustainability more broadly in South Africa.

Chapter 7:

Conclusions

7.1 Introduction: socio-political dimensions to coastal risk in Cape Town and South Africa

Cities are spaces in which environmental, social and economic systems coalesce to form complex and dynamic hubs of both opportunity and significant challenges. The growth of cities, their contribution to greenhouse gas emissions and their expanding set of responsibilities and services (Joshi & Houtzager, 2012; Davison et al., 2016) position them as key actors in the climate change adaptation and mitigation arena (Curtis, 2016). Two thirds of the world's mega-cities⁸⁰ are coastal⁸¹, with approximately 500 million people living within deltas (Moser et al., 2012; Glavovic et al., 2015). In sub-Saharan Africa, cities are expanding faster than any other region on the planet (Binns & Lynch, 1998). Cape Town, as South Africa's largest coastal metro in terms of sea frontage, and because of the extent to which the coastline has been developed, is especially vulnerable to climate change impacts⁸² (Mukheibir & Ziervogel, 2007; Brundrit, 2009; University of Stellenbosch, 2012; Worley Parsons, 2013; Fourie et al., 2015; Brundrit, 2016; Cartwright & Morgan, 2016; CSAG, 2016). The risks generated by sea-level rise, storm surges and shifting wind regimes as a consequence of a warming climate are not limited to the physical loss of, or damage to, coastal property and infrastructure. Risks are manifesting across a broad range of socio-economic and environmental dimensions. Collapsing and unstable infrastructure presents a significant health and safety risk to the general public and detracts from the recreational and amenity value of Cape Town's beaches. In addition, derelict and abandoned infrastructure, as a consequence of exposure to coastal hazards, attracts social ills such as crime and drug abuse which in turn impacts on surrounding communities.

Within a neo-liberal economy, the persistence of South Africa's spatial legacy of apartheid – where coastal development continues to benefit predominantly white communities - and a pro-growth strategy adopted by government (Houghton, 2010), means that the coast of Cape Town finds itself on centre stage from a restorative justice perspective. Coastal development in less affluent areas is seen as a means from which to promote socio-economic redress to counter South Africa's exclusionary past. The coastal risks and hazards presented by climate change have led to a distinctive dichotomy within coastal town planning circles:

80 Mega-cities are defined as having a human population in excess of 10 million people.

81 The definition of coastal is taken from Martinez et al. (2007) as 100km landward of the shoreline to a depth of 200m offshore.

82 A sea-level rise risk assessment undertaken for Cape Town determined that a surface area of approximately 25km² was at high risk to discreet flooding events (Brundrit, 2008).

how to maximize socio-economic upliftment through the conduit of coastal development while simultaneously ensuring that such development is risk averse and sustainable. This 'distinctive dichotomy' sets the platform for formulating the sub-questions of this research as well as the main research question. The following section (section 7.2) provides succinct responses to each of the sub-questions based on the main findings emanating from Chapters Three, Four, Five and Six. The response to the sixth and final sub-question ('How can the design of coastal policy processes be improved to facilitate more responsive and inclusive modes of governance in the coastal risk and vulnerability domain') which has not yet been covered in any chapter so far is also provided in this section. Section 7.3 provides a response to the main research question. Section 7.4 gives a reflection on the methodology and the thesis as a whole as well as an overview of how this thesis has contributed to new knowledge in the domain of coastal risk governance.

7.2 Responding to the research sub-questions

7.2.1 Understanding coastal risks and the inability to respond to self-produced risks

This section provides a response to sub-question one: 'How is risk defined within the coastal governance arena?' From an analytical perspective risk is a function of both vulnerability and hazard. Hazards are typically biophysical in nature and may be described in terms of magnitude and probability of occurrence i.e. earthquakes, fires and storm surges (Pistrika & Tsakiris, 2007). Vulnerability, in turn, relates to the level of exposure to a particular hazard, or from a range of hazards that may coalesce to amplify vulnerability (IPCC, 2014a). Thus social, political, economic or environmental systems may be more or less vulnerable to a particular hazard or hazards depending on the level of exposure (IPCC, 2014a). Vulnerability in itself may be difficult to determine or 'grade' given that environmental risks may develop via multiple pathways in time and space leading to exposures of differing degrees – some of which remain latent - and in different forms (Leichenko & O'Brien, 2002). This is particularly evident in coastal systems whereby environmental hazards, such as climate change induced sea-level rise, are increasingly linked with cross-scalar and non-linear interactions, influenced by different drivers at different scales (Sarewitz et al., 2000; Myers & Kent, 2008).

Compounding the complexity of risk is the notion that risk increasingly has its origins within institutions, despite those institutions being tasked with the responsibility of managing and mitigating risk (Beck, 1992). This

'institutionalized' risk stems from structural or organizational deficits that may exist within institutions, weakening the ability of social systems to respond to hazards, and making social systems more vulnerable. Thus the governance of risk becomes as much about mitigating the impacts from coastal hazards as it about building appropriate institutional and organizational forms that limit the 'self-inflicted' production of risk (see section 7.2.2). Kaspersen and Kaspersen (2001) consider risk as anything that may pose a danger to people or to the things that people value. This definition is applied to the concept of risk throughout this dissertation. Given that risk may originate from different pathways, and where risk may manifest in various forms in time and space, the following examples are typical 'materializations' of risk in the coastal risk governance domain as revealed by this research:

- Damage to, or loss of, property as a consequence of coastal hazards such as sea-level rise, storm surges, coastal erosion or migrating dune systems;
- Negative impact on livelihoods through declining value in investments (property) as a consequence of damage or exposure to coastal hazards;
- Negative health impacts caused by stress and anxiety through loss of livelihoods;
- Threat of injury or death from exposure to coastal hazards or processes;
- Threat of injury or death from coastal defence structures;
- Negative impact on livelihoods of coastal communities through loss of tourism and tourism derived revenue;
- Loss of recreational and aesthetic value of beaches to the general beach-going public as a consequence of coastal erosion and ill-informed or illegal construction of sea-defence structures;
- Increased rates (public taxes) to fund the escalating demand in sea-defences or anti-erosion measures required;
- Increased rates to fund escalating maintenance costs of sea-defence structures;
- Liability and litigation against coastal actors as a consequence of decisions made that may increase risk to any other coastal governance actor;
- Reputational risk of an organization through failing to demonstrate good governance within the coastal risk and vulnerability domain, and
- Political risk through losing votes from the electorate as a consequence of governance decisions as it relates to coastal risk and vulnerability.

The above examples reveal how risk ‘materializes’ across a wide spectrum of interests. Popular phrases such as ‘risk averse’, ‘risk reduction’ and ‘risk mitigation’ become as much about responding to the physical hazards presented by the natural environment as about considering institutional and governance responses and limiting how such responses or societal interventions at large may in themselves produce risk. Perhaps the most salient finding is that the organizational form of the CCT is ill equipped to respond to and address the very risks that the CCT itself is generating. Thus the CCT is not only confronted with escalating physical risks and hazards generated as a consequence of a warming climate, but it also faces institutionally produced risks that are now coalescing with those climate risks.

7.2.2 Political contestation, immutable bureaucracy and the production of coastal risk

This section responds to sub-question two: ‘What is the relationship between governance structures as commonly utilized within local government, ICM and the production of coastal risks?’ This sub-question intended to understand the relationship between institutional and/or organizational form, ICM and risk. The case study of the CCT revealed that institutional deficits exist in the form of rigid and inflexible governance structures – as the Governing System (GS) - in relation to the coastal environment as a dynamic, unpredictable and complex space – as the System-to-be-Governed (SG). A poor fit between the GS and the SG is known to limit the effectiveness of the GS (Kooiman & Bavinck, 2013). In the CCT, a poor goodness of fit is generated through bureaucratic forms of organisation. The central tenets of a conventional Weberian bureaucracy include that of hierarchical and top-down structures of decision-making, an intensely regulatory and compliance-orientated environment and specialization through the creation of individual and separate departments (Weber, 1946). This research shows that these traits are antithetical towards achieving ICM in practice and by implication limiting adaptive and responsive modes of governance.⁸³ The mismatch between the GS and the SG, as a consequence, both generates, and compounds the risks identified in section 7.2.1.

83 These challenges, specifically as it relates to sector-based governance, are not limited to coastal management, but are evident at regional, national and international levels. At these larger levels challenges relate to sectoral governance approaches to systems-to-be governed. In the resolution of these challenges theoretical debates revolve around integration (see Biswas, 2004 on Integrated Water Resource Management), coherence (see Carbone, 2008 on European Union policy coherence), and more recently nexus approaches (see Benson et al., 2015 on water governance). A theoretical debate on these frameworks was not included in this dissertation due to their irrelevance to organizational design at the local scale.

Fukuyama (2013) argues that an appropriate degree of autonomy is a key requisite for enabling good governance. At a first order level of governance, low levels of autonomy position bureaucrats as tools of the political principal yet in examples of efficient and productive bureaucracies, there is a reverse flow from the 'street level' bureaucrat (with greater autonomy) to the political principal (Giddens, 2001; Fukuyama, 2013). Here an 'embedded autonomy' is suggested as an appropriate balance from which to energize innovation, creativity, experimentation, risk taking and ultimately more responsive and reflective forms of governance. As revealed in Figure 1.5 of Chapter One, as well as Chapter Three, the location of the political principal in the CCT at the apex of the decision-making pyramid places them at some distance from both street level bureaucrats and the operational challenges these bureaucrats face. The limited autonomy ceded to operationally-orientated staff within an intensely regulatory and compliance-orientated environment (the second tenet of bureaucracy) restricts operational-level staff from applying innovative, adaptive and experimental approaches to resolving first order governance challenges. The consequence is that these first order governance challenges persist and are amplified through inaction. Some Japanese corporates formally structure organizations to encourage bottom-up decision-making, deviating from Weberian bureaucracy whereby each level within the hierarchical pyramid is only answerable to the one above. Operational level employees in those Japanese corporates are regularly consulted in the process of policy formulation by strategic and even executive director level management. The application of bottom-up processes of decision making, de-differentiation and the devolution of autonomy in Japanese corporates has arguably led to Japan's economic gains and successes in recent decades (Giddens, 2001). The success of this approach is supportive of the notion that bureaucratic structures may be more malleable within developed countries but their rigidities are upheld within developing countries as advanced by Fukuyama (2013). This research presents the argument that these rigidities, under specific circumstances, are fortified within developing country contexts. These rigidities, the drivers behind them, the implications for the governance of risk and prescriptions to overcome these rigidities are shown in Table 7.1.

The third tenet of bureaucracy, that of specialization through the division of labour, has significant implications for institutionalizing ICM and by implication governability of the SG. The role of bureaucracy in the pre-occupation with single portions – the sector, zone, department, discipline - and the consequential culture of myopia and the production of risks, is significant. The world cannot

be compartmentalized when everything is connected to everything else (Myers & Kent, 2008). This is particularly evident in the 'coastal zone' as an indivisible system. Again Japanese corporates have recognized the foes associated with specialization and compartmentalization in such contexts (Giddens, 2001). Within some Japanese corporates new employees spend the first year learning how each of the departments within the organization operates. After the first year, they rotate through many positions from both local branches to headquarters. This is done to expose employees to as many dimensions and expertise within the organization as possible and by the time they reach the pinnacle of their career, they have a 'complete' knowledge of the organizational workings and have mastered all the relevant skills (Giddens, 2001). This approach may be useful in tempering the phenomena raised by Head and Alford (2015) where staff members, immersed within, and confined to their own siloed mentalities within separate departments in differing locations, may lead to messy and uncoordinated responses to governance challenges.

The role of individual departments in the generation of silo mentalities and the problems that arise from such a culture within the CCT is well documented (Laros, 2013; Celliers et al., 2015; Davison et al., 2016). This has resulted in prescriptions of structural reforms throughout the CCT. These prescriptions have centred on the establishment of collaborative platforms for information dissemination both laterally and vertically within and between departments to promote better integration (Davison et al., 2016; Celliers et al., 2015; Laros, 2013). Collaborative platforms such as the CWG, however, represent structural reforms within a larger bureaucratic 'super' structure. The consequence is that the systems and culture of conventional bureaucracy remain dominant while the relatively minor structural reforms *within* the bureaucracy take on a cosmetic or superficial function, remaining largely ineffective (see Chapter Three). When representatives of the CWG separate back into their specific departments at differing physical locations (whether it be in different sections of the same floor, different floors of the same building, or buildings in different geographic areas), they are immersed back into their own departmental cultures, 'siloed' structures and confined to working within their department's budget. Besides creating an 'us and them' mentality, binding agreements between different departments formulated at these collaborative platforms dissipate and tend to get 'lost' in between monthly meetings. The more effort put into holding such agreements in place, the more the 'us and them' mentality is fortified, which in return undermines ICM and collaborative attempts at governance more generally.

The limited literature on how local government may structure itself to facilitate increased degrees of ICM at the local level (Olsen & Christie, 2000) towards more effectively governing coastal risk makes it difficult to build a case to explore alternatives and challenge conventional (bureaucratic) organizational form. The limited knowledge on the relationship between ICM and organizational form at the local level is considered a red flag for coastal cities across the globe. The ability of bureaucracies to override and weaken platforms designed to promote collaborative governance towards enabling ICM is reflective of two competing second order governance structures – that of the bureaucratic ‘super’ structure and collaborative platforms designed to promote transversal management within this ‘super’ structure. These competing second order governance structures are reflective of competing interests, some of which are drawn into the political domain as presented in the following section.

The trialectic between political externalities, rigid governance structures and Integrated Coastal Management

Clegg (1990) argues that organizational form may be influenced by ‘externalities’ such as cultural contexts in which an organization may be located. In the CCT’s case, these ‘externalities’ revolve around the current political climate in South Africa as a young and developing democracy. Cape Town, as with all other metropolitan municipalities in South Africa, is a politically contested city. The desire to manage these cities in an efficient and transparent manner is not only required for good governance but is a key strategy by opposition political parties in control of such cities to build public confidence in the ruling political party, increase the electoral base, and retain power. Bureaucracies are considered one of the most efficient forms of organization from which to manage large-scale social systems (Weber, 1946 cited in Giddens, 2001). This efficiency includes prudent management of financial systems and is considered particularly useful in developing country contexts in terms of limiting maladministration (Fukuyama, 2013). The application of bureaucratic form in CCT to achieve this is certainly evident.

Whilst bureaucracies provide some benefits, they also have their own shortfalls. These shortfalls have led to a wealth of literature that explore and posit alternative forms of organizational structure. Burns and Stalker (1966) refer to traditional Weberian bureaucracies as ‘mechanistic’ and propose an ‘organic’ structure of looser organizational arrangement in which the overall goals are given precedence over ‘narrowly defined responsibilities’. Similarly,

Giddens (2001) proposes a shift from 'rigid vertical command structures' to horizontal, more collaborative models that are flexible and responsive. Such structural changes would encourage bottom-up decision making whereby operational level staff play an active role in policy formulation. De-differentiation is also advocated, whereby there is a shift away from staff members performing narrowly specialized tasks to having more diverse skill sets (Clegg, 1990). Within this body of literature a prominent theme arises as to the value of enabling an 'embedded autonomy', one which shields street level bureaucrats from the influence of the political principal (Giddens, 2001; Eberle & Maeder, 2011; Stankey et al., 2003; Fukuyama, 2013), and which ensures that bureaucrats remain responsive to governance challenges in the pursuit of a more modernized and developed state (Ostrom, 1990; Rainey & Steinbauer, 1999; High et al., 2006).

I argue that in politically contested and developing cities such as Cape Town, these prescriptions of organizational re-design to address the deficiencies of bureaucracy are idealistic. They are idealistic because bureaucracies are created to achieve the political priority of promoting calculability, uniformity and control through regularization and rationalization (Ritzer, 1998). Greater levels of autonomy towards the base of the organizational pyramid may enable creativity and more responsive governance, but this delegation may simultaneously erode the power held by the political principal. There is also the strong possibility that within developing cities the devolution of autonomy is likely to increase the probability for mal-administration and the subsequent reputational and political risk this may generate. It is for these reasons that alternative forms of organisation are unlikely to gain favour and traction.

While upholding and reinforcing the structural tenets of bureaucracy may be useful for achieving clean audits⁸⁴ and building confidence in the electorate⁸⁵, this research shows that this practice is antithetical towards enabling stronger degrees of ICM. This in turn has broader ramifications: in the domain of coastal risk governance ICM is considered the most effective management paradigm from which to enable adaptive capacity towards building resilient coastal communities (Chemane et al., 1997; Falaleeva et al., 1997; Tobey et al., 2010; Celliers et al., 2013). At this point the question becomes how to

84 Since the formation of the CCT, it has received 13 unqualified clean audits (CCT, 2016).

85 The ruling party of the CCT (Democratic Alliance) has increased its electoral base from 53.28% in 2000; 42.26% in 2006, 61.15% in 2011, and in 2016 it secured 66.75% of the vote (News24, 2017).

work within, or around, bureaucracy as a politically rooted and immutable structure within coastal cities to promote ICM and adaptive capacity when these ‘nice-to-haves’ are considered a lesser priority by the political principal? Section 7.2.6 provides a response to this query.

7.2.3 The importance of achieving consensual ‘images’ and ‘instruments’ between departments within a local government organization

A key challenge identified in this research in the governance of coastal risk is the poor ‘goodness of fit’ between elements of a governing system. The investigation into this blockage is framed with the third research sub-question: ‘How does the relationship between governance elements within local government enable or disable government in achieving its goals, specifically as it relates to the implementation of coastal adaptation strategies?’ Governance elements consist of images, instruments and actions. Images refer to the governing ideas developed to rationalize the choice of a particular instrument, where such an instrument is used to achieve the image defined (Kooiman et al., 2005; Chuenpagdee et al., 2008). Actions refer to activities that are mobilized in the application of the instruments in achieving the image. If images do not represent consensus or are loosely defined, governability – as the overall capacity for governance - is expected to be low (Kooiman & Bavinck, 2013). That is to say that the governance of the SG is likely to be poor, and that governance goals are unlikely to be achieved. The same applies to instruments and actions in that if there is no alignment, or if they are not complementary, the resulting poor ‘goodness of fit’ between elements will be obstructive towards the achievement of broader governance goals (Kooiman & Bavinck, 2013). Coastal systems, due to their inherent complexity, institutional overlaps and the governing plurality that surrounds these systems, makes it difficult to form a consensually defined image. Thus the governability of coastal systems is generally considered to be low (Chuenpagdee et al., 2008).

The poor ‘goodness of fit’ between governance elements certainly played out within the CCT in its attempts at mobilizing and implementing a coastal adaptation strategy. In responding to the coastal risks in Cape Town, and proactively setting goals to mitigate the impacts of climate change in a developing city context, an image of risk averse and sustainable coastal development was set as a key governance goal. In working towards this image, a CML was identified as the most appropriate instrument with which to achieve it. Despite CMLs being prescribed as effective socio-institutional

responses to mitigate risk posed by coastal hazards internationally (IPCC, 2014a), nationally (DEA, 2009) and provincially (DEAD&DP, 2016) the actual process of ‘drawing a line in the sand’ to spatially demarcate hazard areas unearthed significant intra-departmental conflicts and differences of opinion to such a degree that the very process of formalizing the CML as a key coastal adaptation strategy was placed in jeopardy.

The process of determining a CML resulted in the explicit formalization of hazardous areas spatially along the CCT’s coastline. The materialization of hazardous areas through cartographic exercises and the incorporation of these maps into CCT planning initiatives – such as the spatial development framework – showed its implications for development opportunities. Of concern was the perception held by some CCT planners that the CML would ‘sterilize’ the coast through limiting coastal development. Politically this was problematic as the CML came to represent an obstruction to restorative justice (see Chapter Five). The CML and the process of delineating it ‘crystalized’ the rules of the game from a development regulation perspective and this generated the realization that different departments had in fact constructed different images of what it meant to be risk averse, and sustainable. Further, there were differing ideas on how the CML should be regulated. One department argued that the CML should be complemented with land use regulations, while another opined that land-use regulations should not be attached to the CML.

As detailed in Chapter Four, these differences stemmed from divergent images between different departments as to what constituted risk-averse sustainable coastal development, and what instruments would be most appropriate for achieving it. The CML and associated developmental restrictions on the one hand came to represent an obstruction and hindrance to broader imperatives of socio-economic upliftment by those departments responsible for facilitating economic growth and development. Within the ERMD, the CML came to represent the last frontier from which to prevent inappropriate and irresponsible development along Cape Town’s coastline. Both images may be framed as normative governance principles but at the time the images held between the different departments were perceived to be mutually exclusive. The initial failure to achieve collective support and buy-in across departments of how to spatially manage coastal risk prolonged the process of formalizing the CML. This was primarily a consequence of a loosely defined image held between the different departments leading up to the delineation of the CML.

The contrasting images and the tensions created was a product of ‘glossing over’ the initial process of opening up spaces for discursive and deliberative debates between various CCT departments in moving towards a consensually defined image and the identification of an appropriate instrument through which to achieve this image. The role of bureaucracies and the formation of separate departments and the difficulties this may create towards defining consensual images should also not be understated.

Although CMLs are a legal requirement in terms of the ICMA as promulgated in 2009, not a single coastal municipality in South Africa has had a CML formally implemented to date.⁸⁶ The failure to adopt CMLs is also indicative of an incongruence between international, national and provincial policy prescripts and the images, instruments and actions prescribed by these policies regarding what works/is achievable at the local level. Chapter Four revealed that generic policy prescripts of best practice as it relates to coastal risk that emanate from scales beyond local government (i.e. international, national or provincial) tend to be de-contextualized and thus not sensitized to the organizational and context-specific nuances that exist at the local level. The uniqueness of each local municipality, whether it relates to physical location and unique local hazards, political climate, socio-cultural histories, population demographics, service delivery demands, intra-departmental disparities, differing departmental cultures, organizational structure etc. requires that images, instruments and actions are conceptualized and formulated *within* local government entities that are familiar with their own unique contexts.

7.2.4 The importance of achieving consensual ‘images’ and ‘instruments’ between different spheres of government

Images and instruments of positivistic precision and the creation of socially detached Coastal Management Lines

The case study of the CCT revealed a poor goodness of fit between governance elements and how this fractured what should have been a collectively supported process by various departments within the CCT in the establishment of the CML. A comparative analysis between the CCT and the Overberg District Municipality (ODM) was undertaken to explore the fourth sub-question of ‘How do governance elements *external* to local government shape and influence the implementation of coastal adaptation strategies

86 This despite the ICMA being promulgated in 2009, and which imposes a legal mandate on municipalities to establish CMLs.

and what are the implications thereof?’ This section responds to this sub-question. Broadening the scope of enquiry was necessary to understand how externalities may determine the goodness of fit between elements, and how this may in turn shape and influence local governments’ attempts at developing and implementing coastal adaptation strategies such as CMLs.

South Africa is often referred to as the consulting state – government is heavily reliant upon the private consulting sector in developing sustainability orientated strategies (Oelofse et al., 2006). The coastal engineering discipline within the coastal risk governance landscape has a powerful role. This is reaffirmed by the notion that positivistic enquiry, upon which the coastal engineering discipline is based, remains the dominant form of knowledge within the natural sciences (Scott et al., in press). The appointment of an engineering firm by DEA&DP (see Chapter Five) to determine a CML methodology essentially generated a high-tech, empirically orientated methodology. The power held by such forms of knowledge resulted in this method being formally accepted as the template from which all CMLs for local government in the Western Cape Province were to be based. Thus the application of positivistic enquiry through the coastal engineering discipline generated an image of ‘calculability’ and ‘precision’ which was considered fundamental to mapping hazards, and thereby promoted risk-averse and sustainable coastal development. The CML came to represent this image of precision and calculability from which to achieve ‘risk-averse’ and ‘sustainable’ coastal development (see Chapter Five).

The formulation of a CML constructed from positivistic enquiry with limited engagement with civil society, as revealed in the case of the ODM, led to contestations and ultimately the rejection of the CML by civil society. The reliance on traditional modes or ‘mode 1’ orientations of knowledge discounted and underestimated the socio-political and economic dimensions that have been proven to be key constituents of coastal risk. The ‘de-contextualization’ of the CML through basing it purely on positivistic enquiry and its delineation resulted in a number of negative impacts on communities for which the CML was being proposed (see Chapter Five). This in turn led to a breakdown in relations between communities of the ODM, the consultants and DEA&DP. Even though this process was undertaken in 2011, suspicion still exists today within the coastal communities of ODM and still presents a formidable barrier to DEA&DP in their current attempts at re-establishing a CML.

Similar impacts and events were experienced in Cape Town. These included concerns raised by the public as to the impacts the CML would have on property values and the political imperative of restorative justice. This concern emanated from the perception that the CML would restrict development (as a vehicle to achieve economic growth and emancipation) and thus obstruct socio-economic upliftment in previously disenfranchised areas. The navigation of these tensions required in the process of delineating a CML is captured in Campbell's (1996) conceptual framework of the Planners' Triangle (see Chapter Five). The framework revolves around the notion that city planners are frequently faced with the conundrum of making trade-offs in promoting the triple bottom line: that of promoting green cities, economic growth within cities, and that such growth is inclusive and equitable. Within Cape Town, processes of prolonged *informal* engagement over a period of approximately 8 years with a range of governance actors were used to identify and understand tensions that exist between the three pillars both within and between government, business and civil society. The unearthing of the different tensions and interests held by different actors was critical in defining a consensual image between the CCT and civil society of risk-averse and sustainable coastal development. This collectively determined image, which captures socio-political, economic and environmental dimensions or risk, resulted in a CML methodology that differed vastly from the CML developed by DEA&DP. The CCT's CML materialized as a highly variable 'line in the sand' with each cartographic deviation of the CML reflective of the negotiated tensions and compromises as per the Planners' Triangle.

This research has revealed that adaptation strategies applied by the state in the coastal risk and vulnerability domain are primarily founded on, and shaped by, positivistic forms of enquiry. Chapter Six also demonstrates how the state's governance mode is orientated towards a top-down, hierarchical and managerial approach. Here hierarchical modes of governance have coalesced with positivistic forms of inquiry as the hegemonic mode and knowledge type respectively in the governance of risk in South Africa. This is not unexpected given the notion that hierarchical modes of governance tend to be less receptive to adopting 'mode 2' orientations of knowledge (see section 7.2.6). By design, hierarchical modes of governance eliminate reflexive and iterative interactions from other governance actors and are seen as a key contributory factor in creating a poor goodness of fit between elements of a GS. The hierarchical mode of governance, which is not receptive to alternative modes of knowledge production, is also a key reason

behind the state's inability to garner public support for the formalization of CMLs within South Africa. Naturally questions arise as to why the state persists with knowledge grounded in positivistic orientations of enquiry and limits engagement with civil society when such an approach has yielded no success to date and is demonstrably amplifying coastal risk. This also despite the wealth of literature on the success of 'co-governing' and knowledge 'co-production' as an effective means to respond to wicked challenges as presented by climate change, and closer to this research, the CVD. At this point it is appropriate to reveal the drivers behind state-centric and hierarchical modes of governance in South Africa. Analysing these drivers provides an entry point for understanding the fourth and final impediment to the governance of risk in South Africa.

7.2.5 Governing coastal risk and vulnerability in South Africa: state-centric and non-responsive

This section responds to the fifth sub-question: 'How do modes of governance influence the effectiveness of governing coastal risk at the local level?' In terms of the IG framework, hierarchical governance is described as a state-centric system with government positioned at the top of the pyramid with governance approaches characterized as being top-down and command-and-control orientated (Kooiman, 2003). As revealed in Chapter Six, the prevailing mode of governance in the coastal risk and vulnerability domain in South Africa is one of hierarchical governance. This mode of governance is demonstrated through three main indicators. The first indicator is based on the degree of participatory engagement between the state and civil-society. In South Africa, within the ICM domain, meta-governance principles of participatory democracy and procedural justice are supposed to be given effect primarily through collaborative forums of coastal committees at national, provincial and local level. The establishment of these committees is a mandatory requirement of the ICMA. The representation of civil society at the National Coastal Committee (NCC) is however non-existent. At provincial and local levels, there is room for much improvement. The absence of civil society from the NCC is concerning given that the regulation of activities in the coastal environment, including those activities associated with the protection of properties exposed to coastal hazards, rests with national government. Yet it is these specific regulations that have a direct impact on private property owners and communities exposed to coastal hazards. The exclusion of these vulnerable property owners as representatives of civil society from the NCC provides the first indicator that signals a hierarchical and state-centric mode of governance.

The second indicator used to identify the prevailing mode of governance was based on an argumentative discourse analysis. This analysis revealed a discourse held by the state (local, provincial and national government) as one of reticence, compliance, regulatory, formal, punitive and threatening. Such a discourse is reflective of a top-down, command and control approach to governance by the state. Reasons for this mode of governance are attributed to the provisions contained in ICMA. The status of the ICMA as South Africa's principle coastal legislation, whereby all spheres of government are mandated to uphold this legislation, results in the uptake and normalization of the isolationistic narrative contained in the ICMA. It is also proposed that the discourse held by the state, in turn, reinforces a hierarchical mode of governance. This suggestion is made on the basis that dominant discourses may shape institutional processes or societal interventions designed to resolve environmental issues (Bird, 1987; Pedykowski, 2003; Peyroux et al., 2014). Here governance mode is considered representative of both an institutional process and societal intervention. While the discourse of the 1990's shaped a policy stance towards participatory democracy, the discourse held by the state in the coastal risk and vulnerability domain today is reflective of a state-centric, hierarchical mode of governance.

The third indicator of the prevailing mode of governance within the coastal risk and vulnerability domain is the discourse held by the private sector. The analysis of speech acts, actions and communication from the private sector with the state reveals a discourse of 'rights' and 'fairness'. The exclusion of the private sector from governance decision-making and collaborative forums as it relates to coastal risk and vulnerability also reveals a discourse of frustration, of 'not being heard', 'alienation' and 'disempowerment'. Due to the power held by the state and the legislation that it applies, the punitive and regulatory discourse held by the state prevails over the discourse held by the private sector. The discourse of 'rights' and 'fairness' held by the private sector arises from the sentiment that principles of procedural justice are not being upheld by the state in the governance of coastal risk. The dissonant discourses held between the state and private property owners and the prevailing mode of governance obstructs the resolution of the CVD. This mode of governance contributes to the 'self-harming' aspect raised previously: the exclusion of civil society from governance processes and decision making is resulting in a failure to gain support for government led initiatives (such as the CML) from civil society.

The mode of governance applied by the state and the exclusion of civil society from collaborative platforms of engagement is polarizing these two actor groups. According to Olsen and Christie (2000) and Siry (2006), the dynamic and complex nature of coastal zones and their regional economies require that governance initiatives are decentralized, focusing on location-specific community-orientated and inclusive-participatory programmes. Similarly, the increasing call to reframe ICM as a ‘management paradigm’, to ‘coastal governance’, is reflective of a desire for flatter modes of power sharing and decision making across the public – private sector divide (Peters & Pierre, 2001; Sowman & Wynberg, 2014). Hierarchical modes of governance evident in South Africa, however, contradict these widely accepted prescriptions of ‘flatter’ modes of governance orientated towards the scale of the local community. Bavinck and Kooiman (2013) elucidate that hierarchical governance modes lean on bureaucratic structures and standardized procedures, both of which are considered significant barriers to connecting governance actors across a range of sectors and disciplines. It is this trialectic that I argue presents a major obstacle to promoting co-governance as an alternative and preferred mode in the resolution of the CVD. Instead the prevailing mode is resulting in a governance inertia, which in turn is amplifying coastal risk. This risk is materializing in the form of increasing vulnerability and property loss, deteriorating beaches as democratic public spaces, and the inability of the state to gain support for important coastal adaptation strategies - such as CMLs – that itself is trying to implement.

7.2.6 The role of informal networks, ‘mode 2’ knowledge production and institutional reforms for enabling responsive governance

This section responds to the final sub-question: ‘How can the design of coastal policy processes be improved to facilitate more responsive and inclusive modes of governance in the coastal risk and vulnerability domain?’

Permeating the bureaucracy for enabling responsive governance: the value of informal networks and the role of the bureaucratic activist

The powerful political interests that entrench rigid organizational structures and the failure of formally instituted collaborative platforms to address the deficits of bureaucratic forms of organization required that creative and innovative solutions were sought. Counter intuitively, solutions to challenges presented by the rigidities of formal governance structures to which government actors are bound, were found within informal approaches to governance. In this sense the use of the term ‘policy processes’ in the sub-

question is misleading as it insinuates that solutions to governance challenges lie within formal governance processes. It is however 'informality' in itself that provides an effective means to counter the limitations of immutable bureaucratic form for promoting ICM: it is the establishment of informal networks that have the ability to permeate the rigidity of governance structures and encourage decision-making that enables more adaptive and responsive forms of governance.

Pelling and High (2005) refer to these informal networks as 'shadow networks'. Consisting of informal and interpersonal relationships and alliances that generate social capital, they are not formally recognized or constituted within bureaucracies. These shadow networks drive innovative governance approaches, risk taking and organizational learning (Rainey & Steinbauer, 1999; Pelling et al., 2008), all of which are central for enabling ICM and more adaptive forms of governance. Perhaps the most powerful attribute is the ability of informal networks to enable 'bottom up' political persuasion through encouraging access to the political principle outside of formal decision-making structures and processes. Thus the establishment of informal networks became a parallel governance function within government as a means to 'grease the wheels' of the bureaucratic machine. On a practical level, the establishment of these networks rests with repeatedly and persistently targeting 'windows of opportunity' from which to build relations between the 'street level' bureaucrat and the political principal, with the latter being otherwise inaccessible at the apex of the hierarchy.

The task of mobilizing and developing these informal networks does not fall within formal job descriptions of any government official. The uptake of this responsibility is a voluntary and conscious decision, becoming both a skill and long-term endeavour. For the bureaucrat, this means consciously being aware of the limitations of the top-down, regulatory culture of government and understanding why these limitations are in place. It also requires personal behavioural shifts: being flexible, willing to experiment and take initiative, openness, persistence, creativity, being approachable and receptive. Those bureaucrats that develop these traits and purposefully build informal networks to promote more flexible and efficient governance may be considered as 'bureaucratic activists'. Betsill and Bulkeley (2004) and Oelofse et al. (2006) use the term 'champions' to describe actors who proactively encourage innovation and solution seeking to challenges where there is no precedent on how to respond to particular governance challenges. Thus a

'bureaucratic activist', although counter-intuitive and an oxymoron in terms, may be considered a champion but which is an employee of government and which is bound to the limitations of bureaucracy. The ideal position that such an activist may be located is at project management level (also referred to as 'section head', see Figure 1.2). Located midway in the hierarchy, the bureaucrat responsible for project management has access to, and influence over, operational level staff, yet is positioned high enough in the hierarchy to gain access to the political principal.

The establishment of informal networks towards enabling more responsive and adaptive forms of governance within bureaucracies is ultimately dependent upon the bureaucratic activist as the instigator. The risk to enabling these networks of informality by the bureaucratic activist is the potential for manipulation towards the bureaucrat's own interests (Desportes & Colenbrander, 2015). This risk is what bureaucracy tries to guard against through preventing maladministration and promoting and upholding 'legal rational authority' (Weber, 1946). Thus the success of bureaucracies in responding to contemporary governance challenges are contingent upon the functioning of informal networks as a parallel governance process, provided that these networks are focused exclusively on enabling and driving good governance.

Informal networks may also play a potent role in breaking down departmental silos through working laterally across departmental divides. This is useful in building consensually determined images as governance goals. While it is the intent of collaborative platforms - such as the Coastal Working Group in the CCT - to provide a platform of negotiation and move towards a shared vision, their effectiveness is limited given that they are nested within a much bigger 'super' structure of bureaucratic form. The value of informal networking driven by bureaucratic activists lies with the persistence of promoting engagement and iterative dialogue between departmental representatives outside of formal structures. Over time, persistent engagement gradually creates an understanding and appreciation of departmental roles, their cultures, their responsibilities as well as their operational and strategic challenges. Intra-departmental familiarity leads to the development of governance elements that are more likely to 'dovetail' in the development of cross sectoral strategies as necessary in responding to coastal risk.

Table 7.1: Summary of the relationship between three types of organizational rigidity and the production of coastal risk in a developing country context

Three types of organizational rigidity and intent	How are the rigidities amplified in developing country contexts?	Link between organizational rigidities and production of coastal risk	Recommendation
<p>Rigidity Hierarchy, centralized decision-making, top-down channels of communication.</p>	<p>Rigid management of the fiscus to prevent mal-administration of public funds necessary for achieving developmental goals. Politically contested cities further strengthen rigidity, striving to limit corruption as a means to demonstrate good governance. In turn this is used to retain power through building confidence in the electorate and obtaining votes.</p>	<p>Poor fit between GS and the coastal environment as the SG. Rigid governance structures antithetical to ICM. Poor degrees of ICM weaken ability of implementing coastal adaptation strategies in practice, leading to loss of resilience and elevated risk. Rigid GS also non-responsive to risk produced as a consequence of very own organizational deficits.</p>	<p>'Bureaucratic activists' to build informal networks and relationships with political principal. Achieve political suasion through informal networks, transcend bureaucratic rigidities and enable a more responsive/reflexive GS, improved ICM and better success in implementing coastal adaptation strategies.</p>
<p>Intent Position political principal at the apex of decision-making pyramid. Fortify control through top-down modes of engagement and control/limit degrees of autonomy towards base of pyramid.</p>	<p>Political contestation intensifies pursuit of regulatory and compliance orientated culture. It is necessary to remain compliant with rule of law, demonstrate good governance, build the electorate and retain power.</p>	<p>Limited scope for creativity, flexibility, experimentation and innovative governance. GS becomes less responsive to SG. Poor degree of ICM, difficulty in implementing adaptation strategies in practice, increased risk.</p>	<p>Establish collaborative platforms that promote reflexive and iterative processes between different sectors, including that within government, institutions of higher education and civil society. Move towards 'Mode 2' modes of knowledge production aiming to align the GS with the SG.</p>
<p>Rigidity Regulatory and compliance orientated environments.</p>	<p>Political contestation intensifies need for control, efficiency, productivity and order to demonstrate good governance and to build the electorate. Sectoral approach to governance thus supported and fortified.</p>	<p>Sectoral governance engenders a siloed, ad hoc, piecemeal approach which is antithetical to collaborative and inclusive governance. In turn this generates a mismatch between the GS and SG (as opposed to ICM which is intended to promote an 'isomorphic' fit). This 'mismatch' weakens the ability of the GS to respond to risk emanating from the SG, as well as risk produced by the GS due to organizational deficits. Production of risk as a consequence becomes self-perpetuating.</p>	<p>Myopic ('Mode 1') knowledge production (linear, reductionist and technocratic) emanating from particular, influential sectors. Uptake and application of sectorally produced knowledge in the coastal risk and vulnerability domain generates mismatch between GS and SG.</p>

Matching knowledge construction with the System-to-be-Governed

This research has revealed how bureaucratic forms of organization may generate a mismatch between the GS and the SG, reducing governability and amplifying risk. The notion of compatibility or ‘isomorphism’ between the GS and SG is not only confined to structural traits of governance systems within the IG framework. I also present the argument that poor governance arising out of ‘mismatches’ may be extended to the domain of knowledge production and orientation. Just as the GS must display characteristics – primarily related to scale: spatial, temporal and organizational – to match the SG (Kooiman & Bavinck, 2013), so too should knowledge be produced in a manner that ‘matches’ the characteristics and complexities that define the SG. Re-visiting section 2.2.2. of Chapter Two, this argument is primarily born out of the notion that traditional forms of knowledge production – or ‘mode 1’ knowledge production - are linear, technocratic and therefore ‘reductionist’ (Von Bertalanffy, cited in Harvey, 1969). Such a mode is also constructed at scales that are irrelevant to the local context (Schon, 1995; Harris, 2002). In the case of contemporary pressures arising from climate change, such modes are ‘...too narrowly conceived to be immediately applicable to the systemic nature of climate change risk’ (Cartwright et al., 2012, p.3). The link between the assertion by Pohl et al. (2010, p. 267) that traditional modes of knowledge production emanate from a ‘clear-cut border and *division of labor* [emphasis inserted] between science and society’ and the influence of bureaucracies preoccupied with specialization and division of labour must also be made.

Knowledge produced in a manner that is ‘incomplete’ or incompatible with the GS and which forms the basis of decision making by the GS is likely to result in poor governance. The case study of the CMLs in the ODM presented in Chapter Five is demonstrative of the ‘mismatch’ that can arise from ‘mode 1’ knowledge production and the subsequent failed uptake of a policy prescript – such as a CML - as a consequence. Founded on traditional modes of knowledge production whereby the formulation of the CML was based on positivistic orientations of enquiry by natural scientists and coastal engineers, such empirically orientated CMLs failed to consider the broader socio-economic dimensions that are part of the fabric of coastal risk governance. The socially detached CML prescribed by the state as coastal adaptation intervention was, as a consequence, rejected by coastal communities. Conversely, the CML for the CCT was developed on a knowledge base orientated towards ‘mode 2’ knowledge production founded on practitioner, scientific, community and expert knowledge. The application

of multiple 'knowledges' generated from heterogeneous practices through including a variety of disciplines in the formulation of Cape Town's CML, produced a form of knowledge that better 'matched' the multi-dimensional complexities of the SG. The formulation of the CML based on this 'mode 2' knowledge orientation is considered one of the main reasons why the CCT has had more success with its CML. The CML now forms part of Cape Town's Spatial Development Framework, which is a critical forward planning mechanism that shapes and determines urban form and typology for Cape Town.

Institutional reforms for enabling a better match between knowledge orientation and the System-to-be-Governed

The co-production of knowledge that matches the contextual realities of the SG depends on factors that may either play an enabling or disabling role in achieving it. The function of ICM, and the loci of coastal climate change adaptation, lies with the Coastal Management Branch (CMB) within the ERMD of the CCT. The partnering of the CCT with an institute for higher education (University of Cape Town) through the Mistra Urban Futures Knowledge Transfer Programme created a hub for knowledge sharing between practitioners and academics from various disciplines. This partnership aimed to stimulate the production of a 'hybrid' knowledge which departs from the traditional form of 'mode 1' knowledge production (Scott & Taylor, 2014). Not only has this partnership encouraged an interdisciplinary approach to knowledge formulation, but the proximity of officials from the CMB to research circles has also necessitated reflexivity and critical thinking of their own coastal governance strategies. Thus the knowledge held by officials within the CMB tasked with driving ICM and developing coastal adaptation strategies is now more compatible with the SG. The 'isomorphism' between knowledge held and applied by the GS to the SG is reflected in the relative success of formalizing the CML through the CCT's SDF.

In addition to enabling the shift away from traditional modes of knowledge production, and recounting from my own personal experience, was the value of the Mistra Knowledge Transfer Programme in exposing CCT officials from different departments to the detailed workings of other departments to which they would not normally be exposed. As described in section 2.2.2, some CCT officials were selected to frame their practitioner-orientated knowledge within an academic environment through publishing in peer-reviewed journals. This process was often undertaken within group settings

requiring officials to present on their individual fields of research, problem statement, research question and then for the group to give collective feedback on each of the presentations. This process was valuable in exposing officials to broader CCT functions and challenges outside of their own departmental 'silos'. To a limited extent there is some resemblance with the Japanese model of exposing employees to a range of disciplines held by various departments within corporate organizations to encourage a more 'complete' knowledge of organizational workings (Giddens, 2001).

While the institutional arrangement between the CCT and the UCT has been useful in formulating and guiding the CCT's own internal strategies, it has been less effective in addressing institutional challenges and governance blockages that exist more broadly between the three tiers of government. In the coastal risk and vulnerability domain these primarily relate to hierarchical modes of governance and orientations towards traditional 'mode 1' knowledge in formulating and implementing governance strategies. This is due in part to national and provincial spheres of government not being represented on this knowledge-sharing hub. The absence of these actors from this hub brings into focus Schattschneider's (1960) concept of institutional bias (see section 1.5.6) where he suggests it is inevitable that actors will fall outside of the sphere of influence of a particular institution. The absence of national and provincial spheres of government weakens governance efforts at responding to and resolving wicked governance challenges such as the CVD. The ability to engage with national government in shifting away from such modes and knowledge bases is weakened if this sphere is not included within these knowledge-sharing platforms.

Addressing the tension between promoting co-governance while ensuring accountability: the role of local government

While the private sector plays an increasingly important role in the governance arena, it is not to say that government, due to its various limitations, is destined to become an obsolete actor. Government remains, and must continue to remain, a critical actor in upholding and promoting essential meta-governance principles, such as restorative, procedural and distributive justice. Section 1.5.3 introduced the tension that exists between promoting co-governance whilst simultaneously ensuring that accountability of governance decision making is retained. As Scott (2000) intimates, within an increasing governance plurality, traditional channels of accountability as a linear relationship between the state and civil society no-longer holds true.

The more actors that are drawn into governance decision making and the more 'level the playing field' between the state and civil-society, the more difficult it becomes to ensure accountability. Similarly Beck (1992) argues that the accountability void may be deepened where there is complicity in responsibility: everyone becomes cause and effect, and thus non-cause (Beck, 1992). The tension between co-governance and accountability is amplified within the domain of climate change governance. Risks associated with climate change are typically latent and 'detached' from their origins. Beck (1992) argues that the untraceable nature of risks, their dispersion and the latency of their manifestations makes it difficult to determine who is accountable for such risks. The opaque origins of risk is certainly evident in the coastal risk and vulnerability domain where the consequences of different actions at different times may coalesce to amplify risks that materialise in different forms over varying temporal and spatial dimensions (see sections 1.2, 1.5.2, 7.1 and 7.2.1).

With traditional channels of accountability, government takes the lead, and government, in theory, is held accountable. In South Africa, where governance in the coastal risk and vulnerability domain is state-centric, government is by and large absolved from responsibility through the legislative provisions of ICMA. In such cases where government gets it wrong in the coastal risk and vulnerability domain (see Chapter Six), the question arises as to who governs the governor? Here co-governance is necessary to 'pull' government towards a more responsive and reflexive mode of governance through engaging with civil-society. The proximity of local government to civil society and coastal risks, the interface that local government occupies between vulnerable communities and other tiers of government (see Figure 1.3) and the intimate knowledge held by local government actors surrounding coastal risk and vulnerability places local government in the most influential position from which to facilitate this shift.

The ability of local government to initiate this shift is largely contingent upon bureaucratic activists within local government, as local government is not mandated to take on this responsibility. Such activism is required to challenge conventions of state-centric governance through facilitating engagement and dialogue between government and civil society. In opening up spaces for deliberation with a range of governance actors beyond government, it is implicit that government will be exposed to various actor interests, some of which may be particularly powerful. Exposure to these interests - that may

also not necessarily be in the interest of the common good - requires that local government lead collaborative processes to determine and adopt collectively defined principles. These principles may be used as a 'compass' from which to navigate the inherent tensions that exist between divergent actor interests, and prevent co-opting in the process of responding to risk and vulnerability. It is the process of generating a consensually determined set of principles that are closely linked to the contextual circumstances of site-specific locations that will shift accountability expectations to the collective.⁸⁷

Within the CCT, a core meta-governance principle focuses on the importance of protecting beaches as democratic public spaces in the interests of the broader public (CCT, 2014b, Annexure B). This principle, which strives to promote both distributive and inter-generational justice, is seen as achieving the greatest benefit to the most amount of people over the longest period of time. Cooper and McKenna (2008) argue that striving towards such a principle offers the strongest foundation from which to enable more sustainable forms of coastal development. Upholding this principle is considered particularly important in South Africa which has one of the highest Gini coefficients⁸⁸ in the world (World Bank, 2018). The coastal zone in Cape Town, as with the rest of South Africa, is certainly a space in which this disparity is starkly evident. Sea frontage property in Cape Town is some of the most valuable real estate in the country, if not the continent (Fin24, 2018). In cases where the risk-development-protection cycle may be unavoidable and beaches lost, this principle may still be achieved. For example, should private properties or public infrastructure require protection at the expense of beaches, such interventions can still make provision for public access and enjoyment i.e. defence structures may duplicate as promenades that create recreational opportunities. This does require that local government guides the planning process and ensures the principles are upheld throughout this process.

The pursuit of consensual decision making within the coastal risk and vulnerability domain should also be framed within an 'experimental governance' narrative. As Boyd and Ghosh (2013) intimate, wicked problems such as sea-level rise require messy solutions through explorative governance

87 The scale of this 'collective accountability' is limited to those actors that are directly exposed to coastal risks and hazards. In the case of Cape Town, these are relatively discrete, well defined locations.

88 The Gini coefficient is considered as the aggregation of gaps between peoples incomes. In 2014 the Gini coefficient for South Africa was 0.65 (World Bank, 2017).

and experimental learning. Government needs to be open and transparent about the inherent uncertainties that exist within the realm of climate change science, how climate change risks may materialize at the local scale and the limited budget with which to respond to such challenges (see Chapter Six). The acknowledgement of these limitations and uncertainties from the outset is necessary to temper expectations that are likely to arise when local level government takes the initial steps of engaging with civil society.

7.3 Responding to the main research question

The responses to each of the sub-questions presented above answer components of the main research question. This section collectively frames these findings in responding to the main research question: ‘What are the origins, contextual circumstances, conceptions and means of addressing coastal risk at the local level, and how does this relate to the prevailing modes of governance in a developing country context?’

The materialization of coastal risk and the negative socio-economic and environmental impacts that result formed the basis from which the main research question was conceptualized. Risk is considered both a function of hazard and vulnerability. Hazards typically manifest as biophysical processes. Within coastal environments these hazards include phenomena such as sea-level rise, coastal erosion, migrating dune systems and storm surge, all of which present a threat to social values. Upon deeper analysis, the presence of these hazards may be considered superficial in that coastal processes, including that of sea-level rise, have been in existence since time immemorial. It is only since the attachment of human value to the coast in the form of development that these processes have been constructed as ‘hazardous’. In understanding the *origins* of coastal risk, the magnitude and frequency of coastal processes and the threat they may pose or the damage that they may cause becomes less relevant. Thus existing vulnerability as a consequence of exposure to hazardous coastal processes is a function of failed governance.⁸⁹ Thus a more powerful orientation for enquiry is to consider the relationship between coastal governance - and the institutions and sectors that play a role in governance - and coastal risk.

89 Some argue that the historic unavailability of powerful models and techniques - used to understand and predict magnitude, frequency and spatial extent of coastal processes - led to inappropriate planning decisions in the past, the result of which is the vulnerable coastal development evident today. This argument however does not address the recurring phenomena commonly referred to as ‘event amnesia’, where development recurs in spaces that have been frequently exposed to coastal processes in the past. This places the coastal risk and vulnerability debate squarely within the coastal governance arena.

A logical point of departure for this enquiry is to begin with local government, which is tasked with the day-to-day and 'hands on' governance of the coastal environment. Enquiries into the CCT revealed that coastal risk was in fact *generated* by the CCT, despite the CCT being tasked with the responsibility of mitigating coastal risk. The production of risk has arisen as a consequence of deficits in organizational form. These deficits have materialized through inflexible governance structures, hierarchical reporting lines and specialization through the division of labour into sectors or departments. Collectively these traits produce an organizational form that is in stark contrast with the form and nature of coastal socio-ecological systems, as the SG. The SG is characterized as an indivisible and dynamic system, with non-linear and dynamic interactions between biophysical elements, as well as actors that contribute to governance processes. The disparity or 'mismatch' in form between the CCT and the SG is that the CCT's adaptive capacity is limited, thus reducing responsiveness of the CCT to the SG. The CCT as a result is less effective at responding to and mitigating the impacts presented by coastal hazards. The deliberate decisions that are taken to uphold and reinforce rigid organizational form – as represented by Weberian bureaucracy - as opposed to more 'isomorphic' forms and processes means that risk from coastal hazards are essentially being produced and self-perpetuated by the GS.

There are contextual circumstances behind the CCTs organizational form. These are by-and-large exogenous factors which are considered as causal elements and drivers behind inappropriate organizational form and the subsequent production of coastal risk. These factors relate to South Africa's developmental status as well as its current political climate. South Africa, as a developing country, is pursuing an industrialized or modern state. This state, typically achieved through urbanization and industrialization, is focused on wealth creation and distribution. A transition to modernity requires a simultaneous shift from traditional religious beliefs that shape and inform decisions to 'rationality' and rational decision making (Beck, 1992). Weberian forms of bureaucracy, the antithesis of rationality, emerged as the prevalent structure informing organizational design within the modernization process (Beck, 1992). In terms of political climate, the CCT is currently governed by an opposition party to South Africa's national ruling party. To prevent maladministration and build confidence in the electorate, bureaucratic form within the CCT has been fortified. The subsequent mismatch between organizational form of the CCT and the SG and the ensuing production of risk is attributed to both the developmental and political state. Risk is set to

be amplified into the future not only due to developmental pressures in pursuit of modernity (where coastal development is being targeted for promoting both restorative and distributive justice) but the impacts of climate change are set to contribute to, and amplify this risk.

The prevailing means of responding to coastal risk in South Africa revolves around positivistic enquiry into biophysical processes and the establishment of spatial planning mechanisms such as CMLs which are formulated on such enquiries. Little, if any, attention is being directed to the risk as product of organizational form or governance deficits. The conceptualization of risk as a linear extension of hazard is attributed to dominant knowledge regimes and modes of governance in South Africa. The coastal engineering discipline holds a powerful position within the coastal risk and vulnerability domain. With a shortage of capacity within government, the traditional mode of knowledge held by the engineering domain is easily transferred to, and taken up by government in the development of adaptation strategies for which government is responsible for. Thus methodological prescriptions for CMLs are typically empirically orientated with little appetite for different disciplines or alternative knowledge orientations. This research has revealed that the prevailing mode of governance in the risk and vulnerability domain in South Africa is hierarchical and state-centric. It is submitted that this mode of governance empowers 'mode 1' orientated knowledge production and holds this mode in place through not creating spaces of engagement with other governance actors across the public-private sector divide. This is evident in policy prescripts emanating from national and provincial government in the coastal risk and vulnerability domain that are orientated towards positivistic modes of enquiry. A case in point being policy prescripts of CMLs that focuses exclusively on physical modelling of coastal processes. The case study of ODM revealed that these prescripts, as a consequence, are decontextualized to the nuances and contextual realities of coastal risk governance at the local level. Their 'abstractness' has resulted in the failure of their uptake as South Africa's chief strategy in responding to, and mitigating risks from coastal hazards. The inability of a single coastal municipality in South Africa to have their CML formalized to date, I argue, is largely attested to this knowledge 'mismatch'.

The prevailing mode of governance has wider implications than normalizing 'mode 1' orientations of knowledge and generating adaptation strategies founded exclusively on positivistic enquiry. Before understanding the wider implications of hierarchical modes of governance in the coastal risk and vulnerability domain, it is useful to understand the drivers behind this mode of governance. Enquiries

into the causality of hierarchical governance reveal linkages to governance processes in developing the ICMA as South Africa's principal coastal legislation. While South Africa's first policy, the White Paper on Sustainable Coastal Development was broadly celebrated on the basis of the widely held consultative processes with a wide spectrum of governance actors in its development, it appears that similar vigorous processes of stakeholder consultation and engagement were not replicated in the formulation of the ICMA as the Policy instrument. Further, core principles of co-governance and inclusivity as bastions of the Policy were diluted in the content of the ICMA (Glavovic, 2006). Reasons for this remain speculative at best. It appears that limited engagement with stakeholders across the public-private sector divide in the formulation of the ICMA resulted in the content of the ICMA concentrating powers within the state. This is particularly evident in the regulatory provisions that focus on risk and vulnerability from coastal processes and climate-change-driven hazards. These specific provisions are considered isolationistic: they absolve the state from liability, place the burden of responsibility of responding to coastal hazards exclusively on the shoulders of vulnerable property owners, and, in the process, ultimately disempower vulnerable property owners. I argue that it is these regulatory provisions within the ICMA, and the power that the state draws from these provisions as the enforcer of national legislation, that engenders a hierarchical and state-centric mode of governance in the coastal risk and vulnerability domain.

Hierarchical modes of governance are however antithetical to more inclusive, participatory orientated forms of governance. Given South Africa's past of exclusion and separation, procedural, restorative and distributive justice have become normative governance principles and are key pillars in the Constitution of South Africa. If hierarchical governance is defined as being state-centric, top down and management orientated, I argue that the ability to promote procedural, restorative and distributive justice, is greatly diminished. Governance processes that are inclusive are likely to produce policy stances that are supported by the electorate (Novak, 2000; Barry, 2005; Field & Field, 2005). It is unsurprising then that the current mode of governance in the coastal risk and vulnerability domain is failing to promote procedural justice, and as a consequence, policy prescriptions such as CMLs are not receiving support from civil society. Such a mode of governance, in the context of escalating risks and hazards associated with climate change, is polarizing the state and vulnerable property owners within the coastal risk and vulnerability domain. The divisions between these two actor groups and the escalating

tensions between the two groups is proving to be obstructive to the resolution of the CVD.

The rigid organizational form within local government, a hierarchical mode of governance and dominance of 'mode 1' knowledge orientations coalesce to reduce governability in the coastal risk and vulnerability domain. If government in South Africa continues to follow this path, coastal risk is set to escalate. The cross-sectoral impacts of risk generated by climate change in the transitional space between land and sea masses - where multiple sectors of government converge - exemplifies the need to ensure active and authentic engagement between the various governance actors. The need for this shift is also amplified given that risk perceptions and the needs and priorities - in responding to risk - may differ between governance actors (Cannon & Müller-Mahn, 2010). Government cannot therefore act autonomously or independently of other actors in governing coastal risk. Local government, due to its position in the governance landscape, is identified as a key actor in facilitating this shift, yet ensuring that such a shift does not create a space in which certain sectors begin to shape governance approaches towards achieving their own narrowly defined interests.

It is hoped that my findings - which emanate from a hybrid actor/research lens - on the internal machinations of local government and the influence of exogenous factors within the broader socio-political landscape, will provide valuable insight into the drivers behind the poor governance of coastal risk and vulnerability. I hope that my research will act as an 'illuminated signpost' that will guide the CCT on a new pathway towards achieving the goals set in its Integrated Development Plan (see section 1.6) from a coastal governance perspective, to guide all tiers of government in achieving the principles enshrined in the national policy: the White Paper on Sustainable Coastal Development (see section 6.3) and ultimately to improve the manner in which government contributes to the governance of coastal risk and vulnerability in South Africa.

7.4 Contributions to knowledge and reflections on research methodology

Contributions to knowledge

In contributing to, and expanding upon theoretical frameworks, it is necessary to return to Lund's (2014, p. 225) question of 'What are these research findings a case of?' Answering this query elevates the debate into a theoretical domain and it is this process that contributes to new knowledge. The most valuable contribution to theoretical debates emanating from this research relate to the linkages and interplay revealed between developmental state, political orientation of cities, knowledge regimes, scale, institutional configurations, organisational form and processes, governance modes, procedural justice, legislative frameworks and the causal role that these elements play in the institutional production of coastal risk.

A literature review in the build up to this research revealed that while literature on the composition and functions of coastal governance structures towards enabling ICM⁹⁰ at regional and national scales abounds (Low Choy, 2006; Stuart et al., 2006), there is a gap in research on how to mobilize and embed participatory ICM programmes and institutional learning at the local level (Olsen & Christie, 2000; Siry, 2006; Celliers et al., 2015). A deeper analysis of this theme led to enquiries on how organizational form at the local level may either enable or disable ICM. Exploring the relationship between organizational form and ICM in a developing country context was facilitated through a review of seminal writings on bureaucracy (Weber, 1946), risk society (Beck, 1992) and Interactive Governance (Kooiman, 2003). The ability of local government to adopt and enact ICM has wider implications that relate to institutional learning - and the ability to facilitate a 'co-evolution' between the GS and SG - as well as adaptive capacity. Both these traits are critical to local government in the context of their position at the coalface of climate risks. The materialization of coastal risk at the local level is closely linked to the interplay between organizational form and exogenous factors associated with political orientation. It demonstrates how political contestation in concert with developmental state strengthens the rigidity of bureaucratic form. These powerful drivers effectively nullify conventional prescriptions of collaborative forums as both organizational and procedural adjustments to counter the deficits of rigid bureaucratic form.

90 While there is significant body of literature on ICM at regional and national scales, inconsistencies still remain on guidelines for promoting ICM at these scales (Mckenna et al., 2008).

It is within this context that this research makes an important contribution to coastal governance at the local level through revealing the value of informal networks (see Sorensen, 1993; Giddens, 2001; Portman et al., 2012; Leck & Roberts, 2015). In pursuing a 'reflexive modernity', Beck (1992, p. 19) poses the following question:

How can the risks and hazards systematically produced as part of modernization be prevented, minimized, dramatized, or channelled? Where they do finally see the light of day in the shape of 'latent side effects', how can they be limited and distributed away so that they neither hamper the modernization process nor exceed the limits of that which is 'tolerable' – ecologically, medically, psychologically and socially?

Through a coastal risk governance lens within a developing nation state at the local level, the use of informal networks makes an important contribution to this query.

This research also makes an important contribution to the problematic of the policy/praxis gap where all too often there is a failure in the uptake of policy prescripts in practice, particularly at the local level (Shove, 2010; Resnick et al., 2012). This research has revealed that even within a specific organization that operates under a specific policy, differing departmental cultures and mentalities – fostered through the division of labour – make for differing policy interpretations. These differing interpretations of policy prescripts and how to achieve them can become obstructive to achieving important governance goals (Drahos et al., 2005). This research has shown that unless international or national policy prescripts take into account local-socio economic conditions and institutional idiosyncrasies, such policy prescripts are likely to fail. It is inevitable though that international and national policy prescripts become de-contextualized from the realities and intricacies of the local level. This aligns with Lund's problematic whereby lessons are abstracted from research and elevated to general conclusions, which in turn form the basis of policy prescripts at national and international levels. Ultimately this de-contextualization generates policy prescripts that are detached and irrelevant to local contexts. In response to this problematic Peck (2011, p. 2) calls for a shift from focussing on policy transfer which is:

Preoccupied with accounts of rationality selected best (or better) practices moving between jurisdictional spaces' to one of policy mobility and mutation, which is 'much more attentive to the constitutive socio-spatial context of policy-making activities, and to the hybrid mutations of policy techniques and practices across dynamized institutional landscapes.

With specific reference to 'dynamized institutional landscapes' this research makes important contributions through revealing the nuances that exist at the level of local government and that without considering these nuances, policy uptake is likely to remain limited. Indeed the findings of this action-based research in relation to policy prescripts have led to shifts in national and provincial policy stances which are now starting to advocate the importance of local knowledge and experiences, rather than being based on international, and foreign prescripts.

This research also contributes to the theoretical framework of IG, specifically as it relates to the drivers behind governing modes and the relationship between governance modes, procedural justice, social cohesion and the production of risk. Here hierarchical or state-centric modes of governance debilitate procedural justice. Conversely co-governance is considered an important pre-condition for promoting procedural justice (Bavinck et al., 2013; Jentoft, 2013). While the pursuit of procedural justice may still result in the marginalisation of actor groups and not lead to substantive justice (Gupta, pers. comm., March 13, 2018), Dobson (1999) advocates that, provided procedures are inclusive and fair, the outcomes of such processes are irrelevant. In ensuring that the outcomes of engagement are not skewed towards the interests of a select and powerful few, procedures of engagement and inclusivity must be lodged within, and guided by, a predetermined set of explicitly defined principles – such as the preservation of beaches for the public good. The use of pre-defined principles must be used to gauge both the representivity and authenticity of the outcomes from such processes.

In South Africa, within the coastal risk and vulnerability domain, and despite transitioning to a democratic state some 23 years ago, hierarchical modes of governance still prevail. This mode of governance contributes to, if not compounds, the already low levels of governability that characterize coastal systems due to their complex and dynamic nature. The low level of governability created by hierarchical modes of governance is attributed to both the procedural *injustices* that emerge as a consequence of this mode and

the propensity for such a mode to hold traditional or 'mode 1' orientations of knowledge production in place. A further contribution to poor governability of the coastal space is attributed to specific legislative provisions that are isolationistic in nature. Due to the power that such provisions carry – as national law, and the responsibility of the state to enforce such provisions, the argument is made that the isolationistic nature of these provisions are in turn engendering a hierarchical mode of governance. This despite such a mode being detrimental to social cohesion, sustainable development and coastal governance.

Reflections on research methodology

I can recount vividly the struggle to construct the research questions as part of the CERES PhD Training Programme undertaken in the Netherlands in 2013. There was a prolonged oscillation between framing research questions that were 'biased' towards my own perceptions and inside knowledge of local government workings with that of constructing 'objective' research questions as would be the case with an external researcher. Given the sentiment around researcher subjectivity and that it can contribute to research bias and weakness, I made the mistake of trying to extricate myself from a 'subjective' position to that of an 'objective' one. This manifested in attempts to construct boundaries between myself and the subject matter as 'social reality'. It was only upon embracing the notion that the researcher is as much a part of the research as those being researched (Mottier, 2005) and consciously dropping the constructed boundaries between myself and subject matter did I make inroads into formulating more appropriate research questions.

Upon reflection on the research questions, I believe it would have been useful to construct a sub-question that focused on the topic of accountability. Towards the end of this research attention was directed to the tension that exists between promoting co-governance while ensuring accountability in governance decision making. Thus queries into accountability as well as a literature review on accountability would have been beneficial to this dissertation.

This is an article-based PhD, with three articles having been published in peer reviewed journals, and the fourth having recently been accepted for publication. An article-based PhD offers both pros and cons. Based on my experience over the last five years however, I do think the cons outweigh the pros. While it is certainly beneficial to publish papers, the very process of

publishing creates additional administrative loads that would not otherwise be the case with a monograph styled PhD. Primarily these loads relate to the delays and disruptions that are caused in the review process which are completely out of one's control. Each journal has its own unique referencing style. Having four articles published in four different journals requires that each of the articles are re-referenced to achieve consistency in referencing style in the dissertation. The submission of articles that were all orientated around the same case study meant that repetition became unavoidable. This repetition is detrimental to the flow of the dissertation. Lastly, it has been more difficult than anticipated to maintain a central and coherent thread throughout the four articles as well as the introduction, methodology and conclusion chapters. Perhaps the benefits of an article-based PhD may only become more apparent in the future, but for now, and if I had to re-do this research, I would opt for a monograph.

Researcher identity has also had an important bearing on this research and as such requires mention. I am described as 'white' according to the South African ethnic classification system. As a relatively new democracy, cultural memories of oppression and exclusion by a white minority remain influential factors in the governance of cities in South Africa (Leck, 2011). I am also located within the ERMD. Here 'green' mentalities, perceived to be held by those officials working within environmental fields, have been associated with exclusion and elitism (Cock & Fig, 2002; McDonald, 2004). My experiences as a governance actor revealed that such constructions and perceptions by other governance actors, irrespective of whether they hold true or not, were evident. The aspect of 'inherited identity' has revealed important insight into how governance decision making as it relates to coastal risk may be influenced and shaped in South Africa (Chapter Five presents more detail on this). Thus the role and influence of identity and positionality in itself has provided important 'data' and has been critical to understanding socio-political nuances and dimensions in the governance of coastal risk at the local level. These insights, I believe, are a direct consequence of my positionality as both actor and researcher.

Several scribes talk about the importance of positional reflexivity in conducting research. Hertz (1997, p. 8) suggests the process of reflexivity must include viewing the self in a critical manner through internal dialogue of 'What I know' and 'How I know it'. Kunda (2013, p. 18) similarly reflects on the importance of introspection and asking oneself questions of: 'Where

did the interpretations I made come from? How were they made to ‘emerge’ both during and after field work’ (Kunda, 2013, p. 18). Given my positionality and the connotations associated with my identity, I was particularly mindful of continually applying a positional reflexivity through the duration of this research. Researchers may also in themselves purposefully or inadvertently shape knowledge production so that the outcomes of research may benefit the researcher’s interests and agendas (Ozanne & Saatcioglu, 2008). Thus the importance of this reflexivity should not be underestimated given that I am a government actor within the coastal governance domain. Interestingly the influence of identity and positionality was more prevalent within my professional function as a governance actor, as opposed to researcher. While the research for this PhD may be concluded, my on-going role as a local government employee necessitates that this positional reflexivity continues.

On a final note, and again linked to positionality, I constantly found myself in the delicate position of revealing some research findings that, while beneficial to this research topic, were not necessarily complimentary to my employer (CCT) nor to other departments of other spheres of government that I work with. At all times I stress that these findings, and considering the PAR research framework applied, are intended as constructive criticism. It is from this viewpoint that I hope that the findings emanating from this research will be reflected upon and used to experiment with alternative approaches to the governance of coastal risk and vulnerability in South Africa.

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Epilogue

Towards the completion of this research the CCT initiated an Organisational Development and Transformation Plan (ODTP). It is currently still in progress and is only expected to be fully complete towards the end of 2019. Broadly speaking the intent of the ODTP is to transform the CCT's administration by improving the manner in which it works and delivers on public services (CCT, 2017c). I mention this process for a number of reasons. Firstly, this organizational re-structuring is reflective of the changing role and pressures that local government is performing and responding to respectively. The shift in responsibilities is reflected in the CCT's own acknowledgement of this whereby cities are '...at the forefront of economic and social change. They represent the arm of government that delivers the services residents use every day, and increasingly face challenges that were once considered the responsibility of national or provincial governments' (CCT, 2017c, p. 10). The pressure on the CCT to provide services is expected to continue escalating given Cape Town's rapidly expanding population. The rate of growth is also compounded due to 'semigration' where there is an increasing influx of people to Cape Town from other cities and provinces (CCT, 2017c). The CCT is in itself expanding and now employs over 27000 staff in over 80 different departments (CCT, 2017c). The pressure associated with an expanding populous and organization is made more severe given the pressures associated with climate change. Cape Town is in the midst of the most severe drought in over a century and the availability of water has long since been known as a key constraint to limits of growth – or modernization - for Cape Town. It goes without saying that these changes necessitate a reappraisal of the CCT's own governance strategies.

The sheer size of the staff compliment and number of departments in itself represents a challenge from a self-organization perspective in the delivery of services. It is this facet that has formed a central thread throughout this dissertation in terms of the CCT's ability to implement coastal adaptation strategies and the notion that risk emanates from institutional and organizational deficits. There is recognition by the CCT of the need to address the deficits associated with bureaucratic forms of organization. This is reflected through the ODTP that intends to promote a local government that is '...completely responsive to residents' needs by providing sustainable, resilient and *adaptable* [emphasis inserted] service' and to 'create a *flexible* [emphasis inserted] organization that can cope with rapidly changing

circumstances, such as environmental factors, urbanization, etc.’ (CCT, 2017c, p. 11). Further the ODTP endeavours to ‘...ensure standard delivery – across different areas as well as compliance with legislation. This way of operating will also break down silos and build strong and flexible centres to respond to customer demands’ (CCT, 2017c, p. 11). These statements have been extracted from ODTP strategy documents and clearly demonstrate an awareness to be more responsive to an increasingly ‘dynamized’ SG.

The ODTP process has also highlighted the need to place greater priority on governing the CCT’s coastal environment. The Coastal Management Branch (CMB) is currently being better resourced as a means to ensure this. Although this dedicated ICM competency is being established and driven by the CMB, this function is still located within a broader organizational bureaucracy. There are still strong hierarchical channels of communication in place, and there is strong emphasis on promoting and upholding a regulatory and compliance orientated environment and limited reference to exploring alternatives in countering the shortfalls of bureaucracy beyond collaborative or transversal committees. Although there is a widespread appreciation to generate more responsive forms of governance, a recent investigation into the ODTP process and governance challenges currently being experienced within the CCT revealed a number of findings that indicate the CCT’s governance style is still strongly autocratic and that this style of governance is responsible for a ‘...paralysing culture of fear both among elected public representatives as well as with officials in the City of Cape Town’ (DA, 2018). The consequence of this, as the investigation reveals, is ‘...a material impact on rational, accountable and transparent decision making in the City’ (DA, 2018). Thus it remains to be seen whether the ODTP creates the required transformative change necessary for the CCT and its governance responsibilities or whether the status quo will prevail. It also remains to be seen how the ODTP and resulting structural reforms geared towards area-based service delivery as well as the formation of a dedicated CMB will impact on the CCT’s ability to promote ICM and adaptive governance. The current drought crisis and the looming ‘day zero’⁹¹ as representative of a dynamic pressure will certainly test the flexibility, innovativeness and responsiveness of this new organizational model.

91 ‘Day zero’ is the date at which the CCT’s major dams are expected to reach dangerously low levels and the taps will be turned off. At the time of completing this research it was estimated to be on the 9th July 2018 (CCT, 2018).

The functional state of coastal environments such as dune systems across the CCT as well as the efficacy of the CCT's Coastal Working Group in responding to and resolving coastal risks (referred to in Chapter Three) as key service delivery responsibilities, will continue to be monitored as outcome orientated indicators during and post the ODTP process. This monitoring will be used to further develop an understanding of the linkages between organizational form and processes, ICM, adaptive governance and coastal risk.

At the end of this research the CCT coastal branch initiated some exploratory forays into promoting flatter – as opposed to hierarchical - modes of governance through framing risk as a shared responsibility between the state and civil society. Although the CCT has initiated this process, the CCT is in un-chartered waters as it is not considered a core function or responsibility of local government to initiate and lead such processes. This responsibility lies with national and provincial spheres of government. However, the inaction by these spheres of government and the close proximity of the CCT to coastal risk has necessitated that the CCT take initiative. This proposal of 'co-governance' of coastal risk and vulnerability will be Cape Town's first pilot study. It will be led by local government for local, national, and provincial government, affected land owners and broader civil society to converge around a 'round table' to deliberate on coastal risk as a collective and shared responsibility to resolve. When these deliberations take place I will certainly be wearing two hats in this process: one that represents local government, and the other that represents an embedded researcher who will continue to draw from these experiences to contribute to wider knowledge on the governance of coastal risk at the local level.

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Annexures

Annexure A: Complimentary publications and outreach

Complimentary academic publications (peer reviewed)

Desportes, I., & Colenbrander, D. R. (2016). Navigating interests, navigating knowledge: Towards an inclusive set-back delineation along Cape Town's coastline. *Habitat International*, 54, 124-135.

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Conferences and seminars and outreach

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Annexure B: City of Cape Town Integrated Coastal Management Policy



**CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD**

INTEGRATED COASTAL MANAGEMENT POLICY OF THE CITY OF
CAPE TOWN

September 2014

Definitions

Accretion:	Gradual accumulation of sediment
Aeolian transportation:	Carried by wind
Biodiversity:	Biological wealth of a specified geographic region: including the different marine, aquatic and terrestrial ecosystems, communities of organisms within these, and their component species, number and genetic variation.
City:	The City of Cape Town established in terms of section 12 of the Local Government: Municipal Structures Act of 1998 by Provincial Notice No. 479 of 2000.
city:	Cape Town
Climate adaptation:	Adjustment in natural or human systems in response to actual or expected climate stimuli or their effects, which moderates harm or exploits beneficial opportunities.
Climate change:	A significant and lasting change in the statistical distribution of weather patterns over periods ranging from decades to millions of years. It may be a change in average weather conditions or the distribution of events around that average (e.g. more or fewer extreme weather events). Climate change may be limited to a specific region or may occur across the whole Earth.
Coast:	The inshore marine environment up to 500 metres seaward of the High Water Mark, the interface between the marine and terrestrial environments and the land directly exposed to coastal processes, tidal influence and storm surges.

Coastal Conservancy:	coastal space, under the administration of the City, that is characteristically unique, representative of the diversity of the City's coastline, represents unique coastal habitat, dynamics and processes, and or heritage and social value that is irreplaceable and of long term value to society as a whole and for future generations
Coastal Protection Zone:	The Coastal Protection Zone contemplated in section 17 of the Integrated Coastal Management Act 2009.
Coastal Edge:	Area around the coast demarcated in Cape Town's Spatial Development Framework as the seaward extent of the City's development footprint, primarily to protect coastal resources and avoid risks pertaining to flood-prone areas.
Coastal zone:	The area seaward of the Coastal Protection Zone boundary, the seashore, coastal waters and the exclusive economic zone and includes any aspect of the environment on, in, under and above such area.
Council:	City of Cape Town Metropolitan Municipality, established in terms of the Local Government: Municipal Structures Act 1998, read with the Province of the Western Cape: Provincial Gazette 558 dated 22 September 2000.
CTSDF:	The Cape Town Spatial Development Framework as approved in terms of the Municipal Systems Act 32 of 2000 (section 34) as well as the Land Use Planning Ordinance 15 of 1985 (section 4(6)).

Development: Any process initiated by a person to change the use, physical nature or appearance of that place, and includes—
the construction, erection, alteration, demolition or removal of a structure or building;
a process to rezone or subdivide land;
changes to the existing or natural topography of the coastal zone; and
the destruction or removal of indigenous or protected vegetation

Development footprint: The outer extent of urban development

Disaster risk management: The continuous and integrated multi-sectoral, multi-disciplinary process of planning and implementation of measures aimed at – (a) preventing or reducing the risk of disasters; (b) mitigating the severity or consequences of disasters, (c) emergency preparedness, (d) a rapid and effective response to disasters, and (e) post-disaster recovery and rehabilitation.

Disaster risk reduction: The systematic development and application of policies, strategies and practices to minimize vulnerabilities and disaster risks throughout a society to prevent and limit negative impacts of hazards, within the broad context of sustainable development. In South Africa, disaster risk reduction is an integral and important part of disaster management.

Dynamic coastal processes: All natural processes continually reshaping the shoreline and near shore seabed and includes —
aeolian movement of sand;
migrating dune systems;
wave action;
coastal storms;
currents;
tidal action;

river flows;
erosion; and
accretion

Ecosystem: A dynamic system of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

EGS: Ecosystem goods and services: The resources and functions that accrue from the natural environment.

Exclusive Economic Zone: The Exclusive Economic Zone of the Republic referred to in section of the Maritime Zones Act 1994.

Heritage sites: Material remains resulting from human activity older than 100 years. This includes wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, territorial waters or in the maritime cultural zone where such wrecks are older than 60 years. Archaeological sites also includes any feature, structure or artefact associated with military history older than 75 years and includes the sites on which they are found.

High Water Mark: The High Water Mark as defined in section 1 of the Integrated Coastal Management Act 2009.

Infrastructure: Any temporary or permanent structure made by humans

Littoral active zone: Any land forming part of, or adjacent to, the seashore that is –

unstable and dynamic as a result of natural processes; and

characterized by dunes, beaches, sand bars and other landforms composed of unconsolidated land, pebbles or other such material which is either unvegetated or only partially vegetated.

Overlay Zone: a more detailed zoning scheme mechanism that is applied in addition to the base zone of a property.

Public Open Space: Land zoned as open space, located in urban areas and accessible to the general public.

Risk: The measure of potential harm from a hazard or threat. Risk is usually associated with the human inability to cope with a particular situation. In terms of disaster risk management it can be defined as the probability of harmful consequences, or expected losses death, injury, damage to property and the environment, jobs, disruption of economic activity or social systems. Hazards will affect communities differently in terms of ability and resources with which to cope. Poorer communities will be more at risk than others.

Vulnerability: The degree to which people, property, the environment or social and economic activity - in short, all elements-at-risk - are susceptible to injury, loss of life, damage, disruption, exploitation or incapacitation by all hazards.

Zoning Scheme: Determines the zoning categories and land uses permitted within each category.

1. Introduction and overview

1.1 The coast as an asset

The City of Cape Town Municipality (the “City”) has an extensive coastline of 307km which is an important economic, social and environmental asset. Characterized by a highly sensitive, complex and dynamic coastal environment, the city’s coastline provides the communities and visitors to Cape Town with a multitude of social and economic benefits and opportunities as well as essential Ecosystem Goods and Services (EGS). Our coastline is an important asset for the City’s economy; it is where our communities pursue recreational activities and where they interact. It draws our visitors, protects our city, property and infrastructure from storm surges, receives our waste, supports our unique and diverse fauna and flora and contributes to the livelihoods through the provision of food. It is central to our history and diverse identities and shapes Cape Town’s unique sense of place. These goods and services provided by the shoreline are key contributors to the city’s economy, desirability and global recognition as one of the world’s most beautiful and popular cities.

Central to this value is that the City’s coast is, and must remain, a common asset belonging and accessible to all. Further, this value of the coast is determined by both its quality and functionality. As such it is imperative that the City implement a policy that not only optimizes the value of the coast and protects it as a common asset for all but one that also creates a framework for the effective governance, decision-making and management of our coastline in the best interests of our city and its communities.

1.2 Problem statement

The integrity and value of Cape Town’s coastline is dependent upon the interaction of numerous biophysical processes. Wave action causes erosion of sediment which long-shore winds and currents deposit along the coast, forming beaches and dunes. Storms are drivers of rapid coastal change, often leading to abrupt erosion events and inundation of coastal areas. These important biophysical processes are highly sensitive to change. This is particularly relevant along Cape Town’s high energy coastline which is exposed to large weather systems and coastal storms.

Historic planning decisions made without the guidance of a City-wide integrated coastal management framework has resulted in the interference

with dynamic coastal processes, degraded coastal environments and which now forms a source of risk to human settlements located in these spaces. The resultant degradation or loss of ecosystem function compromises the ability of these systems to absorb the impacts of further coastal erosion and storm surge, thus exacerbating risk. These problems are likely to worsen given the expected impacts of global climate change, which include sea level rise and an increase in the frequency and intensity of coastal storms.

Risk may be physical, social or financial and can be transferred to coastal stakeholders over periods of time and over space. The degradation of natural coastal processes negatively impacts the social and economic value of the coast. As the coast is a common asset, coastal risk and loss is shared between the authorities and the general public and individuals.

The decision-making processes behind coastal development are therefore crucial for either creating a risk-prone, degraded coast or a high quality, resilient one.

2. Policy and management

An effective policy environment is central to good governance, long term planning and optimizing sustainable opportunities and growth. This Integrated Coastal Management policy is therefore central to reducing risk, both to the City and its communities, and is core to retaining and enhancing the many current and future economic, social and environmental opportunities of our unique coastline into the future. The principles determined in the Integrated Coastal Management policy also compliment and support the principles defined in the National Integrated Coastal Management Act, to which the City is legislatively bound by.

The local authority responsibilities of economic and social development, urban planning and land use management as well as the Integrated Coastal Management Act's requirement for a Municipal Coastal Management Programme, requires the City of Cape Town to incorporate an integrated coastal management framework into its existing planning and management processes. Integration with these processes will require that the ICM policy is integrated with and driven through the City's Transversal Management System. The Integrated Coastal Management policy compliments and cross

pollinates the City's Transversal Management System through defining clear roles and responsibilities across multiple line departments at both an operational and strategic level.

3. Regulatory context

The following legislation, strategies and council policies are relevant to the Integrated Coastal Management Policy:

- Economic Growth Strategy
- Cape Town Integrated Metropolitan Environmental Policy (IMEP)
- Cape Town Spatial Development Framework 2012
- Cape Town Zoning Scheme 2012
- City of Cape Town's Shipping Incident Disaster Management Plan
- Disaster Management Act (57 of 2002)
- Environment Conservation Act (73 of 1989)
- Floodplain and River Corridor Management Policy (2009)
- Land Use Planning Act (once promulgated)
- Land Use Planning Ordinance (15 of 1985)
- Local Government: Municipal Structures Act (117 of 1998)
- Local Government: Municipal Systems Act (32 of 2000)
- National Biodiversity Act (Act 10 of 2004)
- National Building Standards and Building Regulations Act (103 of 1977)
- National Environmental Management Act (107 of 1998) (NEMA)
- National Heritage Resources Act (25 of 1999)
- National Environmental Management: Integrated Coastal Management Act (24 of 2008) (ICMA)
 - Informed by the NEMA principles. These include maintaining and rehabilitating the "diversity, health and productivity of coastal ecosystems" and following a "risk averse and precautionary approach" to coastal management and planning "under conditions of uncertainty".
 - Sections 48-50 deal with municipal coastal management programmes and by-laws.
 - Section 62 deals with the implementation of land use legislation in the coastal protection zone.
- National Water Act (36 of 1998)
- Sea Shore Act (21 of 1935)

- Ship Stranding Protocol
- South Africa's Oil Spill Contingency Plan
- Spatial Planning and Land Use Management Bill (once promulgated)
- The Constitution of the Republic of South Africa: Sections 151(3), 152(1)(d) and 156(5).

4. Strategic intent and desired outcomes

The City envisions a coastline of the highest standard, where coastal ecosystems and our rich natural environment is protected as a sensitive, complex and dynamic space important for our future prosperity. The coast will be managed as core city infrastructure, valued and protected as an asset for current and future generations. The strategic focus areas of the City are enshrined in the City's Integrated Development Plan (IDP) and are categorized into five pillars. The city's coastal environment has the potential to support all five pillars:

The Opportunity City: by having due care for sustainability implications, this policy supports economic and social development opportunities.

The Well-Run City: through this policy, the City will be accountable to its citizens for its coastal decisions.

The Safe City: the reduction in coastal risk created through the enabling mechanisms of this policy provides a safer city for all.

The Caring City: this policy strives towards taking care of Cape Town's people, especially those most in need of assistance, by retaining and improving the state of their coastal environment.

The Inclusive City: this policy entrenches the rights of access to and enjoyment of the coast for all people and will manage the coast in the best interests of all communities.

5. Coastal policy principles

In working towards the strategic intent of this policy, the following coastal policy principles inform the City of Cape Town's coastal custodianship and will be applied in relation to all City coastal decision-making:

- The coastal environment is a shared asset held in trust for the common good of all. Equitable and ease of public access to coastal areas and associated opportunities for the entire coastline is central to this value. The right of each individual to enjoy the coastline in the way of their choice without impacting on other users' enjoyment must be protected;
- The coast is a shared and common asset vested in the interests of the citizens of South Africa. City decisions relating to coast that have an impact on coastal communities will be facilitated by broad based stakeholder engagement and public consultation processes;
- Economic and social development opportunities must be optimized to the benefit, and in the interest, of all residents, with on-going active investment in and management of the Cape Town coastline by the City;
- Development of coastal economic and social opportunities must be undertaken in a manner that does not reduce, harm or degrade our coastal environment or its ability to cope with climate risks in the future. The diversity and healthy functioning of natural coastal ecosystems and processes must be protected, restored and enhanced for their intrinsic as well as their economic, social and environmental values;
- The coastal environment has been inhabited by humans for millennia. Natural heritage resources that represent this history offer unique values that are central to our sense of identity and must be held in trust for future generations;
- Strategic, proactive, consistent and risk-averse coastal decision-making will be made in the best interests of the broader community of Cape Town, including the implementation of proactive and progressive measures now to reduce coastal risk from climate change, sea level rise and storm surge events. This decision making process will include public participation, and
- All individuals must be accountable and responsible for their actions and must have due care to avoid creating negative impacts on our coastal environment. Our coastline must be an environment free of crime and where legal rights for sustainable resource consumption are protected while illegal resource consumption is acted against.

6. Policy directive details

6.1 Common Asset

The coastline is a common asset, a shared space and unique natural and cultural environment which belongs to all South Africans.

In this regard the City will:

- Protect the rights of all people to access the coastline;
- Manage the coastline at all times in the best interests of all and not to the sole benefit or interest of individuals or groups;
- In all decisions relating to the development of the coast, careful consideration will be given to protecting and preserving unique heritage sites, consistent with the City's policies and national law;
- Ensure that future development is appropriately set back from the coastline consistent with the City's Spatial Development Framework.

6.2 Access

Development along the coast can result in valuable spaces which should serve as central points of economic, social, cultural, spiritual, educational and recreational experience instead becoming informally privatized space, limited to a few. Conversely, uncontrolled or informal access to the coast is one of the primary contributors to dune erosion and disturbances of sensitive ecosystems, ultimately compounding risk from coastal processes. A core principle to the City must be equitable access to the coast while ensuring that this access is regulated, organized and controlled in a manner that does not detract from or negatively impact on the coastal environment while also ensuring ease of access for all.

In this regard the City will:

- Formally designate Public Coastal Access Land at appropriate locations along the length of the City's coastline in accordance with the ICMA;
- Ensure lateral coastal public access by acting against encroachment of private property into coastal public open space;
- Where sea defence mechanisms are required, apply an integrated approach to ensure that where possible access to, and the amenity value of the coast is retained and promoted, and

- Ensure that formalized public access points are appropriately distributed along the length of the coastline to facilitate public access for all residents.

6.3 Optimize Economic and Social Opportunities

The coastline underpins much of Cape Town's economy and holds significant potential to contribute further economic growth and social development opportunities in Cape Town. However, the economic and social value of the coastline must be finely managed as poor decision making, poor management, prioritizing short term gains, over-development or inappropriate development can substantially diminish current economic and social value while removing or reducing the potential for any future economic and social opportunities.

In this regard the City will:

- Prioritize long term economic planning and gain over short term gain to avoid the generation of risk to the City and its residents;
- Address the inequalities of the past through promoting appropriate coastal nodal development as detailed in the City's Spatial Development Framework to connect communities to the coastline;
- Assess economic and social development opportunities on the coast in a holistic manner that understands the coastline as a complex system that has diverse opportunities and constraints determined by factors outside of our control;
- To use Integrated Coastal Management as a vehicle within the City of Cape Town to promote long term sustainable employment opportunities across a range of sectors including ecotourism, ecosystems based management, coastal risk reduction and coastal restoration.
- Invest in appropriate infrastructure that supports a wide range of economic and social development activities and opportunities;
- Rectification of historically made inappropriate planning decisions through appropriate regulations, strategies and building codes , and
- Identify and facilitate development of nodal growth points with the intent to optimize the socio-economic benefits of accessing coastal resources.

6.4 Coastal Recreation

Coastal recreation takes many forms and is one of the largest social activities in Cape Town. Coastal recreation underpins a range of economic activities in Cape Town and provides significant social development value.

In this regard the City will:

- Promote and support coastal recreation by maintaining, investing in and developing infrastructure and services that facilitate appropriate coastal recreation opportunities;
- Manage the coast as a shared environment that supports a wide range of recreational activities;
- Where necessary to reduce conflict, congestion, improve safety or reduce environmental social or heritage impact, determine appropriate and defined use zones for various forms of coastal recreation where necessary;
- Where a form of coastal recreation is negatively impacting on the economy, social values and quality of the environment, ban that form of recreation in its entirety or from various locations, and
- Regulate and enforce any recreation activities that require permits from any sphere of government.

6.5 Natural Coastal Processes, Fauna and Flora

Cape Town has a uniquely rich marine and coastal environment with significant diversity in fauna and flora. These natural systems, besides their intrinsic value, form the foundation from which socio-economic systems benefit and community livelihoods are built while playing an essential role in mitigating and reducing risk to the City, its infrastructure as well as private property.

In order to reduce coastal risk, especially given the future impacts of climate change on sea level rise and increased frequency and intensity of coastal storm surges, it is imperative that we maintain a healthy functioning coastline. By maintaining the integrity of the coastline, the economic, social and value of the coast will be optimized.

In this regard the City will:

- Ensure that future coastal development is guided to protect coastal processes and systems;

- Develop and implement a Coastal Overlay Zone as part of the City's Integrated Zoning Scheme to provide an appropriate land use management framework to protect our coastal systems and to manage areas at risk from coastal hazards both along built and un-built stretches of coastline;
- Invest in the on-going rehabilitation of degraded dune systems, beaches, estuaries, coastal corridors, rocky shores and coastal wetland systems;
- Implement Estuary Management Plans that recognize and manage the vital contribution of estuaries to supporting the health of coastal ecosystems, water quality maintenance, the provision of marine species nurseries and the provision of protection against coastal erosion and storm surge damage;
- Play an active role in any activity or process regulated by other spheres of government that have an impact on the City's coastline. This may include the issuing of permits for seine netting, proclamation of Marine Protected Areas etc.
- Designate highly valuable and sensitive natural coastal spaces or coastal heritage sites as Coastal Conservancy land as part of the Coastal Overlay Zone, and
- Undertake coastal waste management in accordance with a Beach Cleaning Operational Protocol that recognizes the importance of retaining functional ecological systems while meeting the social and economic needs of high recreation nodal points.

6.6 Heritage, Identity and Sense of Place

Cape Town's coastline has a varied and rich history, spanning several millennia. It is integral to our history, our heritage, sense of place and unique identity. In addition our coastal landscapes underpin our scenic routes and global desirability and recognition.

In this regard the City will:

- Consider all new coastal developments with regards their potential impact on this unique and irreplaceable landscape;
- Take into account architecture, color, form and position when considering coastal development applications;
- Ensure all signage design and location does not overtly detract from the coastal landscape;

- Ensure that any future coastal defences for the protection of private and public properties and City infrastructure are strategically managed by the City in the interests of Cape Town and its residents.

6.7 Risk Management and Mitigation

Determining the most appropriate and sustainable course of action for addressing coastal erosion and storm surges requires sensitive navigation through the multiple and often conflicting interests of the various stakeholders, including private developers, property owners, government officials (across all three spheres), beach users, civil society and environmental pressure groups.

As the coast changes and options are considered in response to the cross-cutting pressures caused by these changes, which are also expected to be exacerbated by climate change, the City will apply a multi-disciplinary approach in resolving, and adapting to such challenges. Natural systems such as wind, wave action, long shore sand transport, erosion and accretion, and storm action are powerful systems that must inform and guide coastal development and ancillary opportunities. A key principle within this context is that decisions taken to protect any property from coastal dynamic processes must be made in the interest of the broader community and after broad-scale engagement with I&APs and affected parties.

In this regard the City will:

- Apply a consistent, cautious and ,risk averse approach in responding to the pressures caused by coastal erosion and storm surges;
- Favour soft engineering approaches over hard engineering solutions where possible;
- Require all new coastal developments and changes to existing developments to incorporate mitigation of and/or adaptation to coastal climate change impacts as part of their approval process;
- Ensure that coastal defences to protect private property from the threat of coastal erosion is compliant with the relevant legislation;
- To not approve coastal defence structures if such structures will compound risk to the City or its residents into the future;
- Retain the option of managed retreat over defence;
- Require that coastal defences be proven to reduce risk prior to being approved;

- Favour coastal defences which are reversible, flexible, do not negatively impact on sense of place or aesthetics, and have other positive knock-on effects, and
- Undertake a broadly consultative process with the public when deciding on sea-defence interventions.

6.8 Coastal Land Alienation and Acquisition

Where coastal land is unsuitable for development, either due to zoning or for environmental reasons, state ownership of coastal land will be consolidated. This includes acquisition by the City of land falling within its jurisdiction. Refer to the City of Cape Town's Coastal Land Alienation and Acquisition Policy.

6.9 Coastal Safety and Security

Illegal activity along the coast impacts negatively on the marine and coastal environment, the interests of residents, local livelihood opportunities, ecotourism potential and the safety of individuals. Although the City's jurisdiction is determined by the high-water mark, the City recognizes that economic, recreational, environmental as well as illegal activities operate across these jurisdictional boundaries.

In this regard the City will:

- Actively seek to work with all relevant spheres of government and law enforcement agencies by promoting an inter-agency marine and coastal law enforcement approach;
- Protect and support the legal marine and coastal resource consumption activities while actively targeting all illegal resource consumption;
- Work towards developing its own marine and coastal law enforcement capacity and resources;
- Consolidate City Regulations and By-laws to facilitate effective coastal law enforcement;
- Increase visible coastal law enforcement and policing, and
- Ensure appropriate informative regulatory signage is located across the coastline.

7. Indemnities and Risk

The City recognizes that its coastal value is in part determined by the quality of the immediate coastal environment which includes private property. As such, the City is committed to leading open and transparent processes that will seek to find the most appropriate, effective, just and measured solutions to those parts of its coastline where coastal change has resulted in risk to the coastline, public amenity, public infrastructure and/or adjoining private property. In this regard the City will be guided by the Integrated Coastal Management Act in conjunction with the City's own commitment to a quality, safe and resilient coastal environment.

8. Implementation programme: City's Integrated Coastal Management Framework

To give effect to the policy principles, a set of implementation regulations, mechanisms and tools, which together constitute the City's Integrated Coastal Management Framework, will be developed to protect and manage Cape Town's coast in-line with these policy objectives. The overview of the City's Integrated Coastal Management Framework is depicted in the flow diagram below (Figure 1).

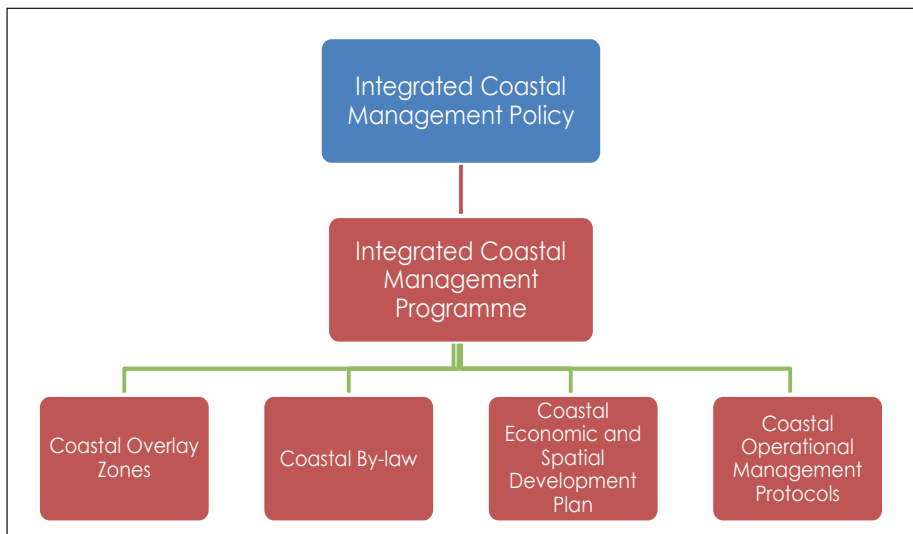


Figure 1: Integrated Coastal Management Framework for the City of Cape Town

8.1 Coastal Area

In order for the City's integrated coastal management framework to be effective, the spaces which it seeks to manage should be defined in a holistic way, taking into consideration the multitude of factors which impact on or are impacted by the dynamic interface between land and sea masses.

Recognizing that social, economic and ecosystem processes take place across the High Water Mark, and given the need to ensure integrated management as well as proactive planning, the City intends to make an application, as allowed by the ICMA, for its area of responsibility to extend 500 metres seaward of the High Water Mark.

This application, if successful, will increase the effectiveness of the Policy as well as the implementation framework. Based on this understanding, the applicability of the City's By-law may extend up to 500 metres seaward of the High Water Mark.

8.2 Coastal Overlay Zones

Coastal Overlay Zones will be developed as a component of the City's Integrated Zoning Scheme. Overlay zones provide a mechanism which allows for the provision of more specific development rules to achieve the purpose of a particular City policy. Forming part of the zoning scheme regulations (development management), an overlay zone provides a more detailed zoning mechanism that is applied in addition to the base zone of a property and is considered the most appropriate mechanism to manage and regulate land use and building development. The introduction of overlay zones is not an inevitable consequence of local area planning initiatives as identified through District Site Development Plan. Rather their introduction and development is a consequence of the critical need identified in the Cape Town Spatial Development Framework (CT:SDF) for targeted and specific development rules in addition to the underlying general base zone of land in the coastal area. In the case of property or infrastructure at risk from coastal hazards, additional development rules in the overlay zone may be applied. Thus, the overlay zone will be used as a tool to be employed on an exceptional basis, where it is critical and strategic that land use and building development are managed not only to achieve a shared vision for Cape Town in terms of the CT:SDF, but also as a means to reduce the City's risk profile.

The Coastal Overlay Zones will therefore fulfil the vision of this Integrated Coastal Management Policy, elevating its policy statements to land use regulations to reduce the City's risk profile, build resilience and promote sustainable coastal development.

The overlays will consist of a general overlay, covering the entire coast, to which a general set of regulations will apply, and local area overlays, in which more specific provisions will apply to particular areas.

8.3 Coastal By-law

The City will develop and implement a Coastal By-law in 2014. A by-law is the specific regulatory means for the City to regulate activities. The City is committed to ensuring that all activities carried out on the coast are conducted in a manner that is responsible, in the interests of public safety, and that such activities in no way detract from the amenity value of the coast or the natural coastal environment.

The by-law will assist in enhancing, protecting and optimizing social and recreational opportunities by providing regulations that ensure socially and environmentally responsible activities along the coast.

8.4 Integrated Coastal Management Programme

The City will develop and implement an Integrated Coastal Management Programme (ICMP) in 2014, as required by the ICMA. This ICMP will be a comprehensive management and action plan detailing the City's day-to-day management approach for all aspects of the coastal environment over which it has jurisdiction, set the consistent standards and operating protocols for a range of coastal aspects and ensure compliance to national legislation.

8.5 Coastal Economic and Spatial Development Plan

The City is currently in the process of developing a strategic plan that examines the coast as a single, connected space and identifies appropriate public coastal development in order to optimize social and economic opportunities, including those linked to the private sector.

The plan will prioritize the stimulation of socio-economic opportunities which will give effect to the objectives of the City's broader Economic Growth Strategy and Social Development Strategy. The plan will among other considerations, address economic and livelihood opportunities associated

with coastal harbours, coastal resort development, public access, marine access points, coastal public transport and consolidation of ecotourism and other commercial and industrial activities along the City's coastline. This long-term planning is especially important in the context of expected climate change impacts, including sea level rise and increased frequency and intensity of storm surges.

Annexure C: Tabularized and abbreviated representation of data management system

Author	Title/location	Keywords/notes	Detail	Pg
Adger	governance and environmental justice for adaptation and mitigation of	Gov struc	Climate change poses significant structural challenges to governance worldwide	Abstract
			Will be impacts into the future - adaptation will be required	Abstract
		Institution	Institutional issues may enable or block adaptive capacity	Abstract
		Global	Examples of global governance responses to climate change	922
		Local	Adaptation takes place at the local	922
		Winners/losers	There will always be winners and losers from extreme events	922
		Intergenerational/Equity	Intergenerational and equity issues require specific consideration	922
		Adaptation	Adaptation can contribute to equality issues in responding to	922
			Greatest single equity issue	922
		Capacity	Capacity to adapt is highly differentiated - see note	922
			Vulnerability is directly inversely proportional to adaptive capacity - if you cannot adapt - you become more vulnerable -link to bureaucracy in developing states	922
		Link to bureaucracy		
			Impacts of adaptation linked to mitigation	923
			Why emissions trading is unlikely to solve the problem and in	923
			Adaptation has a substantially greater effect of reducing the	923
			Greenhouse gas emission reductions should be made by ind	923
			Present day action based on historic responsibility	923
		Climate Justice - link to	Definition of climate justice	923
			Importance of empowered collective decision making	924
			Importance scale in decision making re responses to climate change	924
			The importance of achieving well being and meeting development objectives is a key requisite of adaptation strategies	924
			Vulnerability is directly inversely proportional to adaptive capacity - if you cannot adapt - you become more vulnerable -link to bureaucracy in developing states	925
		Link to bureaucracy		
		Risk society/anthropoc	Vulnerability is correlated with the level of development and that development is correlated with level of institutional reform	925
			The vulnerable are social groups within countries, and not countries in themselves	925
			Impacts of climate change likely to be stronger on those sectors dependant on primary sector industry	925
			What these impacts are likely to be	925
			An example of how adaptation takes place at various scales	925
			How agriculture is likely to be affected by climate change	926
		Moral economy	Moral economy as state led interventions that assist, for example, subsidies to the agricultural industry	928
		Informal institutions	Informal institutions are likely to play a greater role in adapting to climate change impacts - diluting accountability/tracking accountability?	928
			Single biggest even in vietnam (local level loss of resources and authority to take collective action)	928

Annexure D: Abbreviated public comments received in response to government led coastal initiatives

No. #	Comments from	Comments received
1	Professor C.A Brown cate@southernwaters.co.za	<p>1) We totally understand the need to come up with a plan that will enable:</p> <p>a. PRASA to provide a regular and reliable train service, and;</p> <p>b. reduce the cost to the PRASA and the City of regularly having to pick up and remove sand from the road and railway line.</p> <p>Between us, we have lived in the area for many decades, we watch and walk on the beach every day, we discuss issues related to the beach and vlei with one another regularly, and with the numerous interested and affected engineers and ecologists in our valley. We thus have a great deal of experience with respect to Glencairn Beach and surrounds. For this reason, would greatly appreciate having the opportunity to contribute towards discussion and decisions related to different options for protecting reducing the costs of maintenance of the railway line and road, and believe that should such could contribute to a more sustainable and visually appealing solution.</p> <p>2) We are constantly told that Glencairn is a naturally evolving beach, which may be partially true, but the proposed bags are anything but natural and it is extremely doubtful if anything will grow on them. (Cilla – I don't think anything will grow anyhow – the conditions are extremely harsh there – but I agree these options should at last be considered.) Other options that are more in keeping with nature have proved successful elsewhere in the deep south. For instance, at Boulders, Monique Rothenberg of SANParks has successfully shored up her steep slopes with gabions that have soil and indigenous seed in them. Is it not possible to have one type 'building block' for the underground portion of the retaining wall and a second for the portion and will be visible?</p> <p>Further to this, given that the current geometry of the beach is in fact not natural and so the erosion of any structures along the railway line is likely to continue, would it be possible to have regular maintenance of the retaining wall, possibly by way of a beach wardens, to ensure that the 'subterranean' portions remain so and the above-ground portion are covered with sand.</p> <p>3) We, the residents, would like to see an artist's impression of what the bags and beach will look like once this proposed project is finished - possibly one showing the effects of the Northwester and another showing the effects of a Southeaster. We would also appreciate having access to the geomorphologists report we are told was commissioned and completed for the project.</p> <p>4) We are concerned that for a large proportion of the time we will be looking at these bags - not a beautiful sight especially if they are shiny. We must remember that the beach is a key it is part of the most scenic railway line and road in the Far South, which is heavily used by residents and tourists alike. Thus, any 'upgrades' should be aesthetically pleasing, in line with those currently being afforded Muizenberg, St James and Kalk Bay. Furthermore, the sea should be clearly visible from the road, and from houses that look down the valley to the beach.</p> <p>5) We are very concerned about dogs and children getting trapped in the walled/fenced-off area of the railway line, where they will be completely out of sight from the beach. Under normal circumstances this should not happen but we cannot rely on normality, accidents happen and children (and dogs) disappear in the blink of an eye. A suggestion was made that a low fence at the top of the bags might prevent this happening.</p> <p>6) We would like to know both the cost of this project and how experimental it is. At the presentation in St Andrew's various examples were held up of how the scheme would work, but we have since discovered that it has been a complete failure in one of the major projects in which it was used. This was explained away by saying that Glencairn Beach is quite a different story. That may be so, but, we would like to see an example where this approach has been successful? Presumably, the residents where it has failed were also told it would work for their beach.</p>

7) We very much like the idea of concrete slabs instead of the ballast on the railway line and feel this will greatly facilitate the job of keeping the railway line clear of sand. ??? – sorry I missed this

8) Whatever we do must be done with the realisation that the sea and the elements are totally out of our control and we can only draw on what has been done successfully elsewhere under similar conditions.

9) It is most unfortunate that the Public, and especially the residents, have not been a party to all the previous deliberations that have taken place over the past six years and brought the authorities to this way forward. It does not give us confidence that there is apparently so little cooperation and communication between PRASA and the City. The City's departments pass the buck from one to another – with no concerted agreement, such as who is responsible for maintaining the beach, the vlei and the pathways and bridges connecting the two.

10) We do not feel an expensive remedial exercise such as the one currently proposed until such time as the problems in [9.] above have been sorted out.

11) Finally, what impact are the upcoming local municipal elections expected to have on this project?

Annexure E: Copy of report submitted to City of Cape Town Portfolio Committee

Report To Economic Environment and Spatial Planning Portfolio Committee



CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

1. ITEM NUMBER: To be inserted by Executive Support

2. SUBJECT

PROPOSED PLAN OF ACTION FOR THE DEVELOPMENT AND FORMALISATION OF THE CITY'S COASTAL ZONE REGULATORY MECHANISMS IN ACCORDANCE WITH THE REQUIREMENTS OF THE INTEGRATED COASTAL MANAGEMENT ACT (ACT No. 24 of 2008).

ISIHLOKO

ISICWANGCISO ESIPHAKANYISIWEYO SENTSHUKUMO
KUMSEBENZI WOKUPHUHLISWA NOKUMISELWA
NGOKUSEMTHETHWENI KWEENKQUBO ZESIXEKO ZOLAWULO
LWEMIMANDLA ENGASELUNXWEMENI NGOKUNGQINELANA
NEEMFUNO ZOMTHETHO WOLAWULO NGOKUHLANGENEYO
KWEMIMANDLA ENGASELUNXWEMENI (UMTHETHO onguNomb.
24 ka-2008).

ONDERWERP

VOORGESTELDE AKSIEPLAN VIR DIE ONTWIKKELING EN FORMULERING VAN DIE STAD SE REGULERINGSMEGANISMES VIR KUSSONES IN OOREENSTEMMING MET DIE VEREISTES VAN DIE WET OP GEÏNTEGREERDE KUSBESTUUR (WET 24 van 2008)

LSU: C0184

3. PURPOSE

This report seeks support for the process, development and formalisation of a number of coastal zone regulatory mechanisms for the City of Cape Town in accordance with the requirements of the Integrated Coastal Management Act (ICMA). These regulatory mechanisms include the establishment of a Coastal Development Setback Line, the Coastal Protection Zone, Coastal by-law, Coastal Hazard Policy and Coastal Management Plan.

4. FOR DECISION BY

Delegated: for decision by EESPCO

5. EXECUTIVE SUMMARY

The City of Cape Town has a coastline of 307km, arguably one of its greatest economic, social and environmental assets. This coastline is increasingly under pressure due to the high desirability of coastal property and extensive “strip” development, alteration of, and impacts on, natural coastal processes and lack of historical regulations to protect coastal processes and coastal assets. Increased levels of coastal erosion, permanent loss and destruction of dune systems, loss of fauna and flora and increasing levels of windblown sand problems are additional coastal pressures facing the City. These pressures on our coastline and related infrastructure are predicted to increase into the future as a result of climate change and associated sea-level rise and storm surge events. In protecting its economic future and social opportunity, lowering environmental, economic and social risk, complying with legislation and to ensure equitable access and opportunities, the City must now institute appropriate means to protect, manage and formalize its coastal zone.

To date the City has lead a proactive response in this regard which includes:

1. Adoption of a Coastal Zone Management Strategy in 2003;
2. The completion of a sea-level rise risk assessment;
3. The determination of a Coastal Urban Edge (defined by coastal risk, social imperatives, ecological values, coastal processes and scenic values) which was incorporated into Cape Town’s Spatial Development Framework and District Plans, and
4. Public consultation on a Draft Coastal Protection Zone Bylaw in February 2011 aimed at regulating this Coastal Urban Edge.

On the 1st December 2009, the Integrated Coastal Management Act (ICMA) also became legally enforceable and requires that municipalities develop coastal regulatory mechanisms to achieve the goals of the ICMA and to promote sustainable coastal management.

Much of the work completed by the City was undertaken prior to the formalization of the ICMA and as such the City has engaged extensively with the relevant departments from both National Government (Department of Environmental Affairs: Oceans and Coasts) and Provincial Government (Director: Mr. C. K. Rabie, Environmental & Spatial Planning, Dept. of Environmental Affairs & Development Planning) in terms of defining and agreeing on the way forward with regards the City's intention to protect and manage its coastline, the existing planning work completed and ensuring that these interventions meet the needs and requirements of the ICMA.

As such the City, Provincial Government of the Western Cape and National Department of Environmental Affairs has agreed that:

1. The City's Coastal Urban Edge as spatially defined in Cape Town's Spatial Development Framework be considered for promulgation by the Government of the Western Cape as the Coastal Development Setback Line as determined and defined in the ICMA. Formal promulgation of this line is in terms of the powers vested in the MEC. This will streamline and reduce the EIA burden on building development applications;
2. As a means to formally and more effectively regulate the space between the High Water Mark and the Coastal Setback Line, the City's current Draft Coastal Protection Zone By-law be re-named and revised in consultation with the relevant provincial department as well as relevant City line functions and be re-advertised for further public comment before being put to Council for adoption;
3. The City in consultation with the relevant provincial department define a Coastal Protection Zone as the area for which the Coastal Management Programme as per the ICMA would be applicable;
4. The City proceed to draft its Coastal Management Programme as per the ICMA for review by the provincial government, and
5. The City, in consultation with the relevant provincial department, develop, draft and approve a City of Cape Town Coastal Hazard Policy. This Coastal Hazard Policy will address all coastal risk to property and infrastructure from coastal processes and hazards including sea-level

rise, storm surge events and migrating dune systems. The policy will provide a platform which will strategically and systematically guide decisions relating to coastal property at risk from coastal hazards.

6. RECOMMENDATIONS

Delegated:

It is recommended that the Portfolio Committee:

- a. Supports the process, development and formalisation of a number of coastal zone regulatory mechanisms for the City of Cape Town in accordance with the requirements of the Integrated Coastal Management Act (ICMA) as outlined in this report.
- b. Formally supports and requests that the City's Coastal Urban Edge as defined in the Spatial Development Framework be formally considered by the Provincial Government of the Western Cape for promulgation as the Coastal Development Setback Line for the City's coastline as required by the ICMA;
- c. Supports the renaming, review, revision and further public consultation of the City's Draft Coastal Protection Zone By-law as the appropriate means to regulate the coastal space between the Development Setback Line and the High Water Mark;
- d. Supports the spatial definition and mapping of a Coastal Protection Zone for the City for which the Coastal Management Programme would be relevant;
- e. Supports the Drafting of the City's Coastal Management Programme as required by the ICMA as well as a key City tool for managing, enhancing and protecting its valuable coastline, and
- f. Supports the development of a City Coastal Hazard Policy for the City of Cape Town.

IZINDULULO

Zigunyazisiwe:

Kundululwa ukuba iKomiti yeMicimbi yeSebe:

- a. Mayiyixhase inkqubo, yokuphuhliswa nokumiselwa ngokusemthethweni iqela leenkqubo zolawulo lwemimandla engaselunxwemeni zesiXeko saseKapa ngokungqinelana neemfuno zoMthetho woLawulo ngokuHlangeneyo kweMimandla engaseluNxwemeni njengoko kuchaziwe kule ngxelo.

- b. Mayixhase ngokusesikweni yaye mayicele ukuba iMida yeDolophu eseluNxxwemeni yesiXeko njengoko kuchaziwe kwiSikhokelo soPhuhliso lweMihlaba mayiqwalaselwe ngokusesikweni nguRhulumente wePhondo leNtshona Koloni ukuze ibhengezwe njengoMda eCuthelwe uPhuhliso olungaseluNxxwemeni kwiindawo ezingaselunxxwemeni zesiXeko njengoko kuyimfuneko ngokweemfuno zoMthetho woLawulo ngokuHlangeneyo kweMimandla engaseluNxxwemeni;
- c. Mayikuxhase ukuthiywa ngokutsha, ukuphengululwa, ukuphononongwa kunye nokubonisana okongeziweyo noluntu malunga noMthetho kaMasipala olawula ukuKhuselwa kweMimandla engaseluNxxwemeni yesiXeko njengendlela efanelekileyo yokulawula amabala angaselunxxwemeni phakathi koMda oCuthelwe uPhuhliso kunye noMlinganiselo woMphakamo waManzi;
- d. Mayixhase intsingiselo yamabala omhlaba nokuzotywa kwemephu yoMmandla oKhuselweyo ongaseluNxxwemeni wesiXeko nalapho ifanelekileyo iNkqubo yoLawulo lwemimandla engaseluNxxwemeni;
- e. Mayikuxhase ukuqulunqwakweNkquboyesiXekoyoLawulo lweMimandla engaseluNxxwemeni njengoko kuyimfuneko ngokweemfuno zoMthetho woLawulo ngokuHlangeneyo kweMimandla engaseluNxxwemeni ngokunjalo njengesixhobo esiphambili sesiXeko sokulawula, ukuxhasa nokukhusela imimandla yaso exabisekileyo engaselunxxwemeni, yaye
- f. Mayixhase ukuqulunqwa koMgaqo-nkqubo wesiXeko ojongene nezinto ezinobuNgozi ngaseluNxxwemeni kusenzelwa isiXeko saseKapa.

AANBEVELINGS

Gedelegeer:

Daar word aanbeveel dat die portefeuljekomitee:

- a. Die proses, ontwikkeling en formulering steun van 'n aantal reguleringsmeganismes vir kussones vir die Stad Kaapstad in ooreenstemming met die vereistes van die Wet op Geïntegreerde Kusbestuur soos in hierdie verslag uiteengesit.
- b. Formeel steun verleen aan en versoek dat die Stad se stedelike kusrand soos in die ruimtelikeontwikkelingsraamwerk omskryf, formeel deur die Wes-Kaapse provinsiale regering oorweeg word vir promulgering as die terugsettingslyn vir kusontwikkeling wat betref die stad se kuslyn, soos vereis deur die ICMA;
- c. Steun verleen aan die naamsverandering, hersiening en verdere openbare konsultasie van die Stad se konsepverordening oor kusbewaringsone-

- bestuur as die toepaslike manier om die kusruimte tussen die ontwikkelingsterugsettingslyn en die hoogwaterlyn te reguleer;
- d. Steun verleen aan die ruimtelike definisie en kartering van 'n kusbeskermingsone vir die Stad waarvoor die kusbestuursprogram tersaaklik sou wees;
 - e. Steun verleen aan die opstel van die Stad se kusbeskermingsprogram soos vereis deur die ICMA asook 'n sleutelmeganisme vir die Stad om sy waardevolle kuslyn te bestuur, te bevorder en te beskerm, en
 - f. Steun verleen aan die ontwikkeling van 'n Stadsbeleid oor kusegevare vir die Stad Kaapstad.

7. DISCUSSION/CONTENTS

7.1 Constitutional and Policy Implications

Meeting the requirements of the Integrated Coastal Management Act

7.2 Environmental implications

The recommendations of this report will greatly enhance the City's coast as a socio-economic and environmental asset as well as contribute to meeting the policy statements within IMEP.

7.3 Legal Implications

None

7.4 Staff Implications

None

7.5 Risk Implications

None

7.6 Other Services Consulted

SPUD:	Norah Walker	021 400 9325
PBDM:	Jaco Van Der Westhuizen	021 400 7576
SR&A:	Sakhile Tsotsobe	021 400 4638

FOR FURTHER DETAILS CONTACT:

NAME	Darryl Colenbrander
CONTACT NUMBERS	021 487 2355
E-MAIL ADDRESS	Darryl.Colenbrander@capetown.gov.za
DIRECTORATE	Economic, Environment and Spatial Planning
FILE REF No	
Signature : Director	
Environmental Resource Management	

Annexure F: Abbreviated meeting minutes from City of Cape Town Portfolio Committee

MINUTES OF THE MEETING OF THE ECONOMIC, ENVIRONMENTAL AND SPATIAL PLANNING PORTFOLIO COMMITTEE OF THE CITY OF CAPE TOWN HELD IN THE CRUSH ROOM, FIFTH FLOOR, PODIUM BLOCK, CIVIC CENTRE, CAPE TOWN ON WEDNESDAY, 8 FEBRUARY 2012 AT 11:00.

PRESENT: ALDERMAN/COUNCILLOR

DEMOCRATIC ALLIANCE

G Bloor (Chairperson)

X Limberg (Deputy Chairperson)

E Anstey

D Bryant

A Kannenberg

M Kleinsmith

J McCarthy

M Nieuwoudt

F Raymond

D Venter

AFRICAN NATIONAL CONGRESS

A Ehrenreich (left the meeting at 13:30)

V Dyanti

Z Qoba

M Sitonga

UNITED DEMOCRATIC MOVEMENT

M Taylor

OTHER COUNCILLORS PRESENT

B Walker – MAYCO member

J Krynauw

ABSENT WITH APOLOGY

D Mphila

OFFICIALS

J Hugo: ED EESP

A Arendse

O Asmal

T Siganda

C Walters

W Carelse

D Colenbrander

M Crous

C Daniels

A Davison

P Evard

N Fillies

L Gerrans

F Kolala

G Kruger

S Mosdell

E Schnackenberg

K Patte

K Palmer

N Primo

M Walker

N Walker

K Wiseman

C Wright

J van der Westhuizen

R van Eeden

PUBLIC AND PRESS

N Flaatten- WESGRO

I Blackie

J Coetzee

N Furnon-Roberts

S Kube

J Macleinnin

M Mvemve

N Mqikela

G Nel

G Wehle

EXECUTIVE SUPPORT: OFFICE OF THE CITY MANAGER

R Riffel

G Josephs

Z Maginxa (Interpreter)

ACRONYMS USED IN MINUTES

ALD	Alderman
ANC	African National Congress
BCA	Blaauwberg Conservation Area
CBO's	Community Based Organisations
CLLR	Councillor
CMOSS	Cape Metropolitan Open Space System
DA	Democratic Alliance
DEAT	Department of Environmental Affairs and Tourism
EESP	Economic, Environmental and Spatial Planning Portfolio Committee
ERMD	Environmental Resource Department
EIA	Environmental Impact Assessment
FOCOS	Forum of Chairpersons of Subcouncils
HWC	Heritage Western Cape
ICLEI	International Council for Local Environmental Initiatives
IDP	Integrated Development Plan
IMEP	Integrated Metropolitan Environmental Policy
IUCN	The World Conservation Union
GPUP	Green Point Urban Park
MAYCO	Mayoral Committee
MOSS	Metropolitan Open Space System
NGO's	Non-Government organisations
NSRI	National Sea Rescue Institute
PAWC	Provincial Administration: Western Cape
SARCC	South African Rail Commuter Corporation
SDF	Spatial Development Framework
SLH	Smart Living Handbook
UDM	United Democratic Movement
WOF	Working on Fire

**PROPOSED PLAN OF ACTION FOR THE DEVELOPMENT AND
FORMALISATION OF THE CITY'S COASTAL ZONE REGULATORY
MECHANISMS IN ACCORDANCE WITH THE REQUIREMENTS OF THE
INTEGRATED COASTAL MANAGEMENT ACT (ACT NO. 24 OF 2008)**

Members congratulated the officials for an excellent report and proposed that a coastal engineer be appointed to the department.

Mr Asmal confirmed that the administrative process for filling of the position is in progress and receiving attention.

Ald Nieuwoudt enquired whether the rights of property owners inside the coastal zone will be affected, as no proper answer was forthcoming at the meeting it was agreed that the Legal advisor would provide clarity at the next meeting.

Mr Collenbrander responded and stated that private properties in the coastal zone have been excluded and that rights of these property owners have not been affected.

Ald Nieuwoudt proposed that a report be submitted to EESP regarding the rights of property owners inside the coastal zone.

Cllr Kannenberg referred to the properties in the coastal zone and enquired about the City's operational procedures with regards to rezoning and the submission of new building plans from the property owners.

Ms Walters informed the meeting that the Coastal protection by-law has not been drafted but that it will contain all legal aspects and that the CTZS will determine the land use and rights for all affected properties,

RESOLVED that:

- (a) EESP supports the process, development and formalization of a number of coastal zone regulatory mechanisms for the City of Cape Town in accordance with the requirements of the Integrated Coastal Management Act (ICMA) as outlined in this report;
 - (b) EESP formally supports and requests that the City's Coastal Urban Edge as defined in the Spatial Development Framework be formally considered by the Provincial Government of the Western Cape for promulgation as the Coastal Development Setback Line for the City's coastline as required by the ICMA;
 - (c) EESP supports the renaming, review, revision and further public consultation of the City's Draft Coastal Protection Zone By-law as the appropriate means to regulate the coastal space between the Development Setback Line and the High Water Mark;
-
- (a) EESP supports the spatial definition and mapping of a coastal Protection Zone for the City for which the Coastal Management Programme would be relevant;
 - (b) EESP supports the Drafting of the City's Coastal Management Programme as required by the ICMA as well as a key City tool for managing, enhancing and protecting its valuable coastline, and
 - (c) EESP supports the development of a City Coastal Hazard Policy for the City of Cape Town.

**ACTION: DARRYL COLENBRANDER
THE MEETING TERMINATED AT 15: 20
G BLOOR
CHAIRPERSON Date**

Annexure G: Example of local newspaper clipping on the social risks associated with coastal erosion

4 Wednesday June 1 2016 **NEWS** **Tabletalk**



■ Parts of the fence bordering Woodbridge Island stand submerged in water.



■ The fence outside Woodbridge Island has sunk below the high water mark and has become a danger to beachgoers.



■ A partially visible sign on the fence indicated that it was put up to help dune rehabilitation.



■ Seaweed and dirt are caught in the tattered fence outside Woodbridge Island.

Frustration builds over beach fence

ATHINA MAY

Milner residents are frustrated about the fence out-

Concerns regarding the state of the fence were aired on the Milner-

fence. The Department of Environmental Affairs (DEA) investigated the legality of the fencing structure

approached for comment, the body corporate manager, who refused to be named, said no notice regarding

coastal public property, which needs to be recalled. "The fence is below the high