

# **Enablers and Barriers to Local Adaptive Capacity**

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## **A Case Study on Coastal Governance in the Maldives**

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## **Declaration of oath**

I hereby declare an oath that I have written the present dissertation on my own with the title: "Enablers and Barriers to Local Adaptive Capacity – A Case Study on Coastal Governance in the Maldives" and have not used other than the acknowledged resources and aids. All passages taken literally or analogously from other publications are identified as such. I further declare that this thesis has not been submitted to any other German or foreign examination board and that the submitted written version corresponds to that on the electronic repository.

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## **Abstract**

In the decades to come, a crucial challenge for small island states will be the protection of the coasts. Coastal issues, such as erosion and flooding events, are expected to worsen due to climate change impacts and local human interferences. A need to investigate alternative approaches to deal with coastal issues has manifested itself, as past approaches have shown shortcomings. These alternative approaches open up opportunities for local-level groups, i.e., the local government and the affected community, to play an active role. However, the local capacity to adapt is enabled or hindered by a multitude of factors that are embedded in the multilevel coastal governance system. Local adaptation is not a straightforward process: it is constantly influenced by the contested nature of decision-making processes, the sociopolitical context, as well as by community-specific characteristics. Identifying governance factors that act as enablers or barriers is crucial to understanding local coastal adaptive capacity comprehensively.

Based on these considerations, this thesis develops a framework whose components are investigated against the backdrop of the broader sociopolitical context they are embedded in. A first component of the framework encompasses the identification of formal as well as informal institutions that range from the culturally embedded risk and problem perception, preferences regarding coastal protection strategies, to how information is exchanged between and on levels, amongst other factors. The second component scrutinizes the influence of community-specific characteristics, including the relationships of the people to each other as well as to the place they inhabit. The framework's components are investigated against the backdrop of the broader sociopolitical context they are embedded in. These objectives are addressed in the Maldives by contrasting the opinions and perceptions of national-level actors in the capital and local-level actors and the affected community on Fuvahmulah, an island in the country's far south. This analysis is based on empirical data obtained through a number of social science research methods in the capital and on Fuvahmulah.

On the one hand, the empirical findings reveal that barriers to local adaptive capacity include a strong hierarchy and a lack of inclusion of lower-level actors and the community in coastal governance by powerful national-level actors, amongst others. It is furthermore shown that political developments in the country have caused trust issues and hindered cooperation. On the other hand, enablers were identified. These included that the affected community perceived the local level to play an increasingly important role in coastal governance. This appears to grow out of a high degree of place attachment and a low degree of trust in the national government. In sum, this thesis provides an approach to understand how locally suitable strategies to address coastal issues can be achieved in times of increasing natural and anthropogenic pressures.

## Zusammenfassung

Der Schutz der Küsten wird in den kommenden Jahrzehnten eine entscheidende Herausforderung für kleine Inselstaaten sein. Küstenprobleme, wie Erosion und Überschwemmungen, werden sich voraussichtlich aufgrund von Auswirkungen des Klimawandels und lokaler menschlicher Eingriffe verschlimmern. Da bisherige Ansätze für den Umgang mit Küstenproblemen sich als unzulänglich erwiesen haben, werden alternative Herangehensweisen notwendig. Diese alternativen Ansätze eröffnen den Akteuren auf lokaler Ebene, d.h. der lokalen Regierung und der betroffenen Gemeinschaft, Möglichkeiten, eine aktive Rolle zu spielen. Die Anpassungsfähigkeit auf lokaler Ebene wird jedoch durch eine Vielzahl von Faktoren ermöglicht oder behindert, die in das Mehrebenen-Küsten-Governancesystem eingebettet sind. Lokale Anpassung ist jedoch kein geradliniger Prozess: Sie wird durch Entscheidungsprozesse, den soziopolitischen Kontext sowie durch Merkmale der betroffenen Bevölkerung beeinflusst. Die Identifizierung von Governance-Faktoren, die Veränderungen entweder zulassen oder behindern, ist entscheidend, um ihre lokalen Auswirkungen auf die Fähigkeit der Küsten sich anzupassen, umfassend zu verstehen.

Ausgehend von diesen Überlegungen entwickelt diese Arbeit einen Rahmen, dessen Komponenten unter Berücksichtigung des soziopolitischen Kontextes untersucht werden, in den sie eingebettet sind. Eine erste Komponente des Rahmenwerks umfasst die Identifizierung formaler wie informeller Institutionen, die, unter anderem, von der kulturell eingebetteten Risiko- und Problemwahrnehmung, über Präferenzen bezüglich der Küstenschutzstrategien, bis hin zum Informationsaustausch zwischen und auf verschiedenen Ebenen reichen. Die zweite Komponente untersucht den Einfluss gemeinschaftsspezifischer Charakteristika, einschließlich der Beziehungen der Menschen untereinander sowie zu dem Ort, an dem sie leben. Beide Komponenten werden mit Blick auf die Einflüsse des soziopolitischen Kontextes untersucht, in den sie eingebettet sind. Diese Aspekte werden auf den Malediven untersucht: Meinungen, Wahrnehmungen und Interessen von Akteuren auf nationaler Ebene, in der Hauptstadt, werden denen von Akteuren auf lokaler Ebene, auf Fuvahmulah, einer Insel im äußersten Süden des Landes, gegenübergestellt. Diese Analyse basiert auf empirischen Daten, die mit Hilfe von Methoden der Sozialforschung in der Hauptstadt und auf Fuvahmulah gewonnen wurden.

Die empirischen Ergebnisse zeigen unter anderem, dass eine starke Hierarchie und die mangelnde Einbeziehung von Akteuren der unteren Ebenen durch mächtige Akteure auf nationaler Ebene Hindernisse für die lokale Anpassungsfähigkeit darstellen. Darüber hinaus wird gezeigt, dass die politischen Entwicklungen im Land Vertrauensprobleme verursacht und die Zusammenarbeit zwischen den Akteuren behindert haben. In der Analyse wurden auch ermöglichende Faktoren identifiziert, z.B. dass die betroffene Gemeinschaft Akteure auf lokaler Ebene eine zunehmend wichtige Rolle im Küsten-Governancesystem zuschreibt. Zudem wurde ein hoher Grad an Ortsverbundenheit, als positiver Faktor für die lokale Anpassungsfähigkeit identifiziert. Zusammenfassend lässt sich sagen, dass diese Arbeit einen wichtigen Ansatz liefert, um zu verstehen, wie lokal angepasste Küstenanpassungsstrategien in Zeiten zunehmenden natürlichen und anthropogenen Drucks erreicht werden können.



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## List of Abbreviations

ADC	Atoll Development Committee
CCAP	Climate Change Adaptation Project
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
EU	European Union
GDP	Gross domestic product
GEF	Global Environment Facility
GoM	Government of the Maldives
ICCR	Integrating Climate Change Risk to Resilient Island Planning
IDC	Island Development Committee
IWDC	Island Women’s Development Committee
LGA	Local Government Authority
MDP	Maldivian Democratic Party
MEE	Ministry of Environment and Energy
MHI	Ministry of Housing and Infrastructure
NAPA	National Adaptation Programme of Action
NBS	National Bureau of Statistics
NGO	Non-governmental organization
PAPI	Paper-and-pencil interviewing
PPM	Progressive Party of Maldives
SES	Social-ecological system
SIDS	Small Island Developing States
SNAP	Strategic National Action Plan for Disaster Risk Reduction and Climate Change Adaptation
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States dollar
WDC	Women’s Development Committees

# 1 Introduction

Changing coasts are part of the geography of small islands, and their coasts have always been understood as a zone of transition. However, climate change is expected to increase the pressures on coastal zones, pushing the boundaries of what island communities have traditionally had to cope with. On small islands, infrastructure and, more importantly, human settlements are, owing to the smallness of the islands and the growing populations, located in close proximity to the coast and are increasingly threatened by impacts of climate change (*Nicholls and Cazenave 2010*). While small islands are considered to be intrinsically vulnerable to climate change due to their small land area, fragile ecosystems, remoteness, low disaster mitigation capabilities, and economic factors in general, their coasts are viewed as especially vulnerable: erosion, saltwater intrusion, storm surges, and the flooding of freshwater wetlands are only some of the impacts affecting small islands around the world already today. Furthermore, projections show that the sea level will rise one meter or more until the end of the 21<sup>st</sup> century, almost certainly increasing the impacts on small islands (*Nurse et al. 2014*).

Affected societies need to adapt to these impacts. Adaptation has gained significance as one of the two approaches to respond to climate change identified by the United Nations Framework Convention on Climate Change (UNFCCC). Since it is now widely acknowledged that the alternative approach, mitigation, will no longer suffice, adaptation has been gaining traction in academia as well as in practice (*Bassett and Fogelman 2013*). In a general understanding, adaptation to climate change is the "process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities." (*IPCC 2019, 678*) Adaptation, or "managing the unavoidable" as *Brown and Sovacool (2011, 127)* expressed it, is a broad concept and encompasses diverse groups of actors as well as a myriad of options and activities to respond to a challenge posed by climate change. *Pelling (2011, 23)* illustrates this by asking four questions when looking at adaptation initiatives: "What to adapt to? Who or what adapts? How does adaptation occur? What are the limits to adaptation?"

Climate change adaptation in coastal zones is particularly complex due to the ecological and socio-economic factors that shape it (*Wong et al. 2014*). In general, adaptation measures to coastal changes are differentiated into four strategies: accommodation, retreat, protection, and land claiming (*Dronkers et al. 1990, Nicholls 2018*).

*Accommodation* attempts to reduce the impact of the hazardous event. *Retreat* encompasses the permanent relocation of the affected community to safer areas. *Land claiming* is the winning of

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new coastal land area by landfill, often designed with a higher elevation. The strategy of *protection* usually takes advantage of man-made structures, such as revetments or sea walls that aim to protect the coast from further erosion. Another strategy is to implement so-called building-with-nature methods or related soft coastal protection measures, which utilize naturally occurring materials and coastal elements to protect the coast.

The decision which approach is chosen is influenced by a number of factors and by numerous actors. Scholars have established that adaptation actions include a wide range of groups, from national and local governments, international and national non-governmental organizations, international donor organizations, and the affected community (*Duit and Galaz 2008*). All of the above have responsibilities and influence in addressing coastal issues whilst following varying values, aims and beliefs. Successful adaptation approaches need to take the different actors with their various interests and skills into account. By considering the diverse actor groups and associated interests in adaptation initiatives, an increasing understanding of adaptation as a social process has developed (*Wolf et al. 2013*). For adaptation initiatives to be successful, there is a need to bring actors that are located on different levels to work together based on institutions, i.e., on rules and other aspects that shape the cooperations. Starting from this understanding, adaptation can and must be scrutinized from a governance perspective. After years of focusing on quantifying climate change impacts and vulnerabilities and discussing adaptation from a natural scientific perspective, a focus has been put on the socio-political aspects of adaptation (*Pielke and Sarewitz 2005*). This allows an understanding of the diverse processes, structures, as well as institutions on the multiple levels that shape adaptation initiatives and lead to their success or failure. Although scholars acknowledge that the appropriate governance of coastal issues and climate change adaptation is crucial to achieving successful outcomes (*Eisenack et al. 2014*), it remains unclear how the different actors that are located on various levels influence one another and either enable or constrain adaptivity.

More and more studies have shown that adaptation initiatives do not always meet their objectives, either wholly or partly (*Biesbroek et al. 2013, Measham et al. 2011*). Consequently, there is a growing field of literature addressing barriers to adaptation. Barriers to adaptation are factors that cause less efficient or less effective adaptation, higher costs, or lead to missed opportunities (*Eisenack et al. 2014*). Barriers can have legal, cultural, technical as well as institutional causes. Literature on the institutional barriers has shown that adaptation initiatives that are mainly planned and organized on the national level, where national governments and organizations from the international climate change policy arena are often the most influential actors,

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are not able to properly address the problems caused by climate change (*Adger et al. 2012, Adger et al. 2009a*). For example, in many small island countries, questions regarding adaptation measures are decided on the national level without integrating the local level and without sufficient information regarding site-specific conditions. This leads to the problem that the adaptation measures are not tailored to the local conditions and thereby fail to work properly or even cause adverse consequences. It is common in small island countries that coastal protection structures are poorly constructed, leading to exacerbated degradation of the coastal environment (*Betzold and Mohamed 2017, Ratter et al. 2016*). To avoid such problems, developments in adaptation scholarship have been stressing the importance of the local sphere of the endeavor (*Betzold 2015*). It is argued that local adaptation efforts from local level actors, i.e., the lower-level government and NGOs, as well as the affected community, are most appropriate to address the problems. These have the best prerequisites to identify responses tailored to the local conditions and to act on these (*Baker et al. 2012, Measham et al. 2011, Alexander and Mercer 2012, Mercer et al. 2012*). Put differently, adaptive capacity on the local level is needed to deal with the environmental changes and to influence actions that address these (*Barnes et al. 2017*). Adaptive capacity is the ability of groups to anticipate and respond to change in order to prevent negative consequences, to be able to recover from the consequences and to take advantage of new opportunities (*Grothmann and Patt 2005*). The degree of adaptive capacity on the local level can therefore be seen as enabling or hindering a way to cope with environmental changes through a local approach. Much of this, however, hinges on the willingness of the local actors to get actively involved, which in turn presupposes that they perceive their own role in this process as both influential and of actionable importance. Furthermore, narrowing the scope of adaptation actions to only include the local level does not reflect adaptation practice (*Klein et al. 2014*). National governments are highly influential and play an important role by shaping the institutional arrangements and are instrumental in enabling or constraining the local level's capacity to adapt (*Huitema et al. 2016, Mercer et al. 2007*). Consequently, it is necessary to analyze how the actors on the different levels are interlinked and interact with one another and what roles and responsibilities the actors have to understand how coastal issues are currently addressed and how barriers are thus created.

Moreover, whether adaptation approaches are successful or not depends on the sociopolitical context that adaptation is embedded in (*Nightingale 2017*). Political interests and struggles influence how problems are framed and shape the adaptation approach as well as the outcomes. For more sustainable outcomes of adaptation initiatives, there is a need to study how adaptation is embedded in the wider sociopolitical context. While most climate change adaptation studies

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have remained apolitical (*Eriksen et al. 2015, Taylor 2015*), some studies have identified political influences as barriers to successful climate change adaptation in island states (*Ratter et al. 2016*). However, it remains unclear how the adaptive capacity on the local level is affected by the political context and discourses at the national and international levels. Research approaches that neglect the influences of politics on adaptation will not be able to generate appropriate answers to the problems of adaptation initiatives. As part of the re-politicizing of climate change adaptation literature, it is one aim of this work to show how politics manifest themselves overtly or covertly in climate change adaptation practices on the local level (*Klepp and Chavez-Rodriguez 2018*).

### **Research Interest**

Looking at the issues at hand – the increasing stressors for small islands and the increasing demand for responses to coastal issues on the one hand, and the overstrained national governments on the other – there is a need to understand how the local level can be better integrated into the adaptation activities. In order to understand how the local level's capacity to deal with current and uncertain future conditions is shaped, there is a need to identify and assess the factors that enable and constrain the capacity to adapt on the local level. On the basis of these considerations, the aim of this thesis is to answer:

How do the multi-level governance system and the sociopolitical context enable or hinder local adaptive capacity?

In other words, this work studies the possibilities and the willingness of the groups on the local level to be involved in activities that deal with coastal challenges and the factors that influence them. A particular focus is laid on the sociopolitical context that coastal adaptation is embedded. It assesses the extent to which the formal and informal institutions of the multi-level governance system include or exclude local actors and the community from participating in coastal governance. Secondly, the contextual factors, i.e., the sociopolitical context including the historical developments, are analyzed to detect how they shape the attitude and interests of the groups on the local level concerning their willingness to be involved.

The research builds on empirical fieldwork in the Maldives, an archipelagic island state located in the Indian Ocean and a Small Island Developing State (SIDS). SIDS are a distinct group of countries that are seen to be particularly vulnerable to a wide range of climate change impacts, such as less rainfall, more frequent and stronger storms, and coral bleaching, to name only a few. The Maldives are already facing impacts of climate change today, and coastal issues are

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seen to be one of the most pressing issues for the lowest-lying country of the world. For example, in the year 2004, 64 percent of about 198 inhabited islands have reported serious erosion problems on the coast (*MEE* 2015a, 18). Studies are anticipating increasing coastal risks for the country, and scholars of climate change agree that the country will further need to adapt to these coastal alterations (*Wadey et al.* 2017, *Aslam and Kench* 2017). While all four coastal adaptation strategies introduced above have been implemented, the main strategy that is pursued in the Maldives is protection. In more detail, the construction of hard coastal protection measures has been the main approach (*Shaig* 2011). However, demand for coastal protection on the islands remains high. While the coast of the capital of the Maldives, Male', is protected in an almost fortified manner (*Naylor* 2015), many other inhabited islands of the country are lacking desperately-needed measures to protect their coasts from erosion or have implemented maladaptive measures (*Duvat and Magnan* 2019). In further detail, *Sovacool* (2012) identified poor planning capacity in outer atolls, lack of coordination, and varying political commitment to coastal adaptation as the main barriers to adaptation in the Maldives. In general, the demand of the political actors is for higher investments in coastal protection measures to prepare the country for climate change-induced coastal issues. However, studies show that coastal challenges on the Maldivian coral islands are fully or partly caused by ill-designed coastal structures, such as harbors or coastal protection measures, and by other anthropogenic interferences (*Duvat and Magnan* 2019). In consequence, the studies indicate that more considerate handling of coastal issues could lead to more resilient coasts under the consideration that islands are able to naturally adapt to environmental changes, such as rising sea levels, to a certain degree. It has been increasingly shown that coral islands possess natural resilience provided by elements of the islands' coastal ecosystems, including the coral reefs, seagrass meadows, and coastal vegetation. These coastal elements provide coastal protection services for the islands. However, the coastal elements need to be maintained and protected to be able to provide the services. Thus, these elements provide an alternative, a more locally based approach to coastal protection, where the locally affected population is able to influence the protection and thereby the resilience of the islands. Consequently, it is necessary to understand what actions harm and protect the coastal elements and see in how far these elements are perceived to be of importance for addressing future coastal issues by all involved. Closely related to these nature-based measures are man-made soft coastal protection measures, which are based on principles of natural coastal protection or support the coastal protection services provided by the ecosystem. Islanders on the Maldives are able to reduce negative anthropogenic influences on these coastal elements and to react rapidly to negative developments. Furthermore, as the local actors and the affected

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community have specific local environmental knowledge of the coastal elements and the conditions, their involvement in issues relating to coastal governance could be beneficial.

The national government of the Maldives has already shown steps to redistribute authority to lower levels of government in the course of decentralization, including tasks concerning coastal protection. Yet, due to political interests and several shifts in the government, the status of decentralization is unclear (*Transparency Maldives* 2019). Also, a number of studies have shown the local government as well the affected communities are lacking integration in decision-making processes in the context of environmental projects (*Niyaz and Storey* 2011, *Zubair et al.* 2011). Against the backdrop of these framework conditions, coastal governance in the Maldives is lacking clarity. Similarly, climate change and adaptation to it is a highly political issue in the Maldives in general (*Kothari* 2014, *Arnall et al.* 2014). Political interests on the national level have led to shortcomings in building resilience to climate change on the local level, as *Malatesta and Di Schmidt Friedberg* (2017) have pointed out. They have identified a climate change discourse in which the Maldives is framed as highly vulnerable to climate change, and that has been utilized by the national political elites to promote their political agendas. The authors argue that the national climate change discourse, which is utilized for the international climate change arena as much as it is for the local population, is an obstacle to integrating local action in addressing social and environmental challenges (*Malatesta and Di Schmidt Friedberg* 2017). Therefore, it is likely that adaptation initiatives by the national government are not always based on the objective needs of communities but are highly influenced by political interests. Another way politics have manifested themselves in the Maldives is by the high divisiveness caused by a political rivalry between the two main political parties, the Maldivian Democratic Party (MDP) and the Progressive Peoples Party (PPM). The divisiveness between the two main parties has left its marks on the cohesion in the society. This is significant because for local-level groups to get involved in questions of addressing coastal issues, there is not only the need for cooperation between the national government and the local level government, NGOs, and the affected community. It is also important that the people on the local level are able to work together, which is strongly influenced by social cohesion.

### **Case Study Approach**

The problems surrounding coastal adaptation in the Maldives suggest that governance and political factors on the national level influence adaptation activities on the local level. However, how these aspects affect local-level adaptive capacity is uncertain as there is limited empirical data from the local level, i.e., from the local level government and affected communities in the

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Maldives. Until today, islanders and coastal communities are often perceived to be victims and treated accordingly (*Armitage et al. 2017, Farbotko 2010*). There is little focus on the interests and possibilities for action of islanders. This thesis sets out to help fill this knowledge gap. It is based on empirical fieldwork done on Fuvahmulah, one of the largest and most populous islands of the Maldives and located peripherally in the far south of the country and on the capital island Male'. The two research locations reflect the study's two main levels of analysis, the local and the national level. Male' is the administrative and power center of the country. Fuvahmulah has been suffering from strong coastal erosion for the last two decades. Even though Fuvahmulah has obtained city status in 2014, which devolved the rights to manage coastal issues to the lower-level government from the capital, the actors on the island feel highly dependent on the national government to respond to the coastal erosion problem.

This thesis analyzes the structures of and processes in coastal governance and factors in the Maldives' general political and societal realm to identify factors in the multi-level coastal governance system and the sociopolitical context that influence local adaptive capacity. In other words, it highlights the interplays between multi-level governance, including the processes and structures it is embedded in, and local adaptive action in the context of coastal issues. Importantly, it puts a special focus on the opinions and interests of the affected people on the local level. Based on two surveys with the affected population, interviews with local and national actors, as well as observations, this thesis improves the understanding of how coastal governance is practiced in the Maldives. Due to the particular historical context of the Maldives, the core-periphery relationship between the power center of the Maldives and a peripheral island that is affected by coastal erosion and dependent on the action of the political actors in the capital is acknowledged in the analysis. It further analyzes how these power relations affect the way the community and other local actors of a peripheral island understand their roles in adaptation measures and how these perceptions have changed over the last years in which the Maldives have undergone profound political changes.

In the light of the foregoing considerations, the ecological, political, and social components of the case study are delineated as a first step. This includes the coastal environment with a special focus on the increasing coastal vulnerabilities and the coastal protection services the islands' coastal ecosystem provides, the historical and current political developments, and socioeconomic factors. In the following, the governance system is analyzed, including how the planning, organization, and implementation of coastal protection initiatives are conducted and what actors

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on the different levels are involved. Secondly, the factors that influence the local adaptive capacity are analyzed. This includes a critical look at how coastal issues are being experienced by all involved actors and the community and how these groups comprehend their role and the roles of others in addressing the issues. Furthermore, it is shown how addressing the coastal problems is influenced by the governance structures and how information and knowledge are distributed and shared among the involved. Also, the values and interests that shape the processes and an investigation of relationships on the local level are included in the analysis. Based on the analysis, it is then discussed how the governance factors, as well as the sociopolitical context, have influenced the likeliness of local actors to be involved in coastal adaptation. An in-depth examination of a case study provides promising answers to the posed research questions and allows to further the conceptualization of adaptive capacity by better scrutinizing the role of institutions, the sociopolitical context, and discourses. On a conceptual level, this also allows to further the concept of barriers to adaptation by highlighting how institutional barriers are established, reinforce each other, and how they are sustained over time by pinpointing the interplays between different elements and levels of the system.

### **Structure of the Thesis**

This thesis is divided into seven chapters. Chapter 2 introduces the theoretical and conceptual foundation of the study, which is applied to assess the enablers and constraints of local adaptive capacity. It commences with how adaptive capacity brings together the two concepts of resilience and vulnerability beneficially to allow a more in-depth assessment for adaptation studies. The chapter highlights how the analysis of governance allows the assessment of adaptive capacity, introduces five governance variables, and discusses why there is a need to consider the local situation of the community in more depth regarding the relationships between community members and between the people and the place. The necessity to analyze power relations is furthermore discussed. Finally, the analytical framework, as well as the research questions, are presented (Fig. 1).

Chapter 3 focuses on the thesis' research design and methods. The various utilized qualitative and quantitative methods are discussed in detail, encompassing literature and media analysis, two population surveys, semi-structured interviews, and observations and fieldnotes.

Chapter 4 delineates the general characteristics of the study's analytical components, including the geographical, political, and socio-economic features of Fuvahmulah and – where beneficial – of the national level.

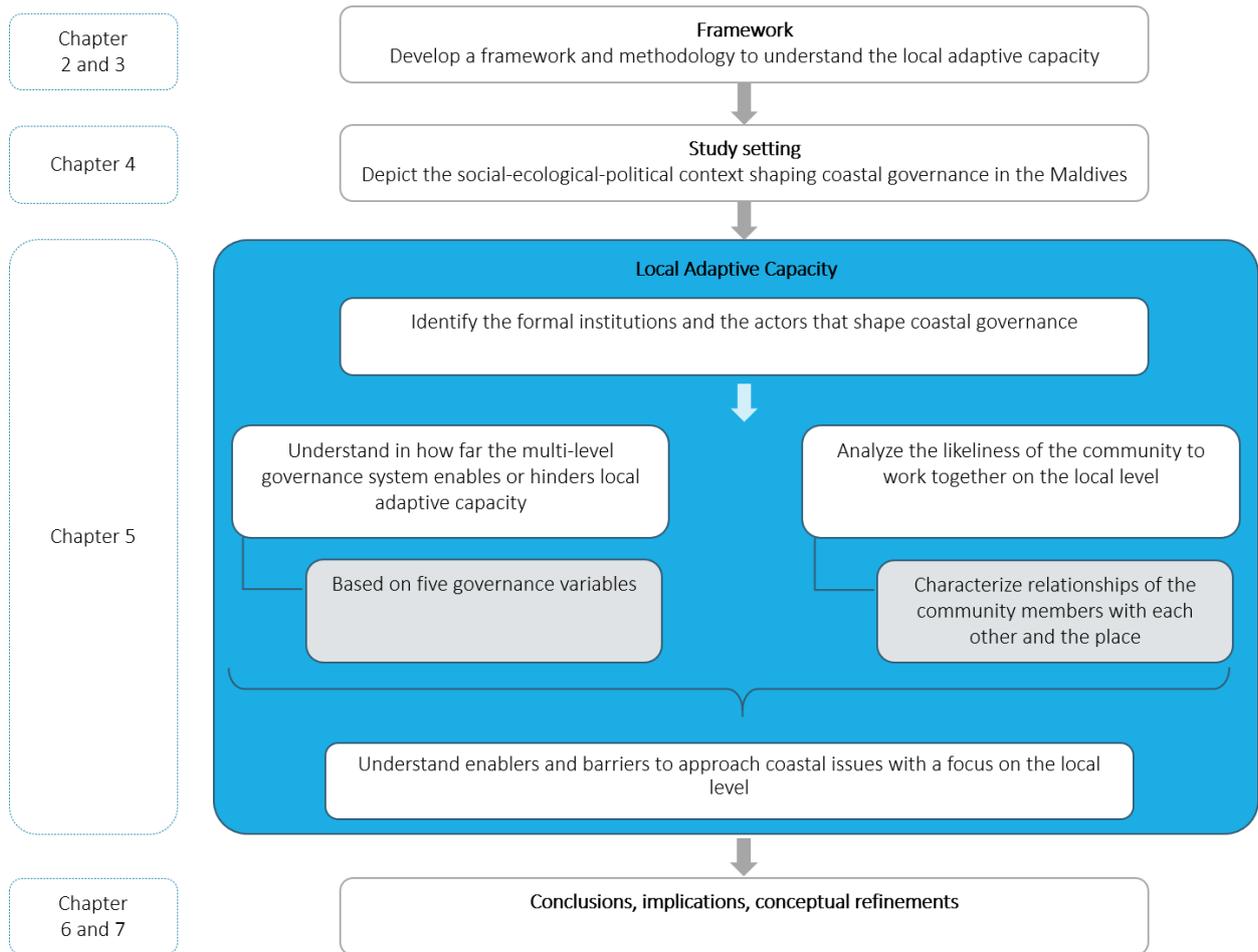
## Introduction

Chapter 5 is based on the collected empirical data. Based on the framework that is presented in chapter 2, this part assesses the local adaptive capacity in the context of coastal governance. To begin with, it stakes out the legal context and formal institutions of coastal governance of the Maldives and outlines the multi-level governance structure. The regulatory framework and the relevant actors, including the depiction of their mandates, are identified in more detail. In the following, it is shown how the governance structures and the political influences on the multiple levels have shaped the perceptions, interests, and actions of the actors and have thereby acted as enablers or barriers to local adaptive capacity.

Chapter 6 critically reflects upon the findings of the thesis, discusses the enabling and hindering factors for local adaptive capacity in Fuvahmulah, and assesses whether an altered approach to addressing coastal issues is possible. It furthermore spells out the need for context-specific governance as a conclusion of the findings. The part is followed by a reflection on the conceptual and methodological approaches and their impacts on the results.

Chapter 7 provides the conclusions of the study by delivering a summary of the core results. It discusses the need for integrating contextual factors in the analysis of adaptation studies in order to advance the understanding of adaptive capacity whilst also presenting the relevance of the findings.

# Introduction



**Fig. 1: Structure of the thesis (own illustration)**

## 2 Conceptual Framework: Local Adaptive Capacity

On small island states and in the face of climate change and sea-level rise, the need to address coastal issues is increasingly necessary. Adaptation has been understood as a task that is best performed on a national scale. However, overtaking of national governments, lacking resources at all levels, and the instrumentalization of climate change adaptation by government actors have shifted the focus towards the capacity to adapt on the local level. This encompasses the local level governments, NGOs, as well as the affected populations in places in need of adaptation measures. However, the ability to adapt to changes is not the same everywhere and depends on a number of influences from other levels as well as within the local level. Therefore, it is necessary to better understand what capacity to adapt is available on the local level and how it is determined by influences and factors from outside the local context.

This chapter delivers the conceptual framework that delineates the approach to understanding local adaptive capacity, its theoretical foundations, and how local adaptive capacity is shaped by influences within and outside the local context. As adaptive capacity in the context of climate change is closely linked to adaptation, the first part of the chapter commences with a brief outline of adaptation and the close ties between the two concepts. In the following, the two frameworks, the resilience and the vulnerability framework, in which adaptive capacity has its roots in are delineated, and the strengths and weaknesses of the conceptualizations are highlighted. Also, the necessity of the integration of a critical perspective is stressed. It is then discussed how a governance approach is able to bring these frameworks together and provide a comprehensive understanding and assessment of adaptive capacity. In this context, five governance variables are introduced that support the assessment. After that, the necessity to include a community-specific perspective in the investigation is introduced, which focuses on the relationships between the community members as well as to the place they inhabit. The chapter concludes with merging these considerations and introducing the analytical framework and the guiding research question of this thesis.

### 2.1 Adaptation

Adaptation as a concept originates in biology, where it focuses on how species have genetic and behavioral characteristics that allow them to better live in a habitat, to endure, and to reproduce (*Dobzhansky* 1968, *Smit and Wandel* 2006). Transferred to social sciences, it deals with how individuals and groups, as well as institutions, are able to cope with and adapt to changing environments (*Denevan* 1983). Adaptation of humans to environmental changes as

such is nothing new; however, the purposeful way how adaptation has become part of the political and economic discussions in the context of global climate change and its impacts is a novel development (*Adger et al. 2009a*). Increasing attention has been paid to adaptation to climate change since it has become widely accepted that mitigation goals will not be met and because climate change impacts are already affecting people today. In a general understanding, adaptation to climate change encompasses all individual and societal actions that aim at adjusting to the already experienced or expected impacts of climate change (*Eisenack and Stecker 2012*). There are two main dimensions of adaptation to climate change, the technological and the management dimensions (*Nunn 2009*). The former encompasses measures like the relocation of settlements, construction of infrastructure, or the restoration of ecosystems. For a long time, decision-makers and scholars predominantly focused on the technological dimension. However, there has been growing interest in the management dimension of adaptation to climate change since it has been recognized that technological adaptation needs to be concorded with societal and political factors in order to be sustainable. *Adger et al. (2009a)* discuss that adaptation to climate change is coined by human habits and practices. The research has demonstrated that adaptation is highly context-specific, and cultures, perceptions, and values are relevant factors influencing adaptation. Consequently, adaptation needs adjustments in human practices and habits and not only physical structures. This increased focus on the societal dimension in adaptation studies has been strongly influenced by literature on socio-ecological systems, as well as the literature on common-pool resources and collective action (*Folke et al. 2005, Ostrom 2007, Adger et al. 2005, Bisaro and Hinkel 2016*). The societal dimension is also important in a second approach to understanding adaptation that focuses on the quality of adaptation and differentiates between reactionary and anticipatory adaptation. Reactionary adaptation is often predominant in the climate change literature and puts the focus on the responses of a system to changes that have already occurred. Anticipatory adaptation, or planned adaptation, is seen as exclusive for humans because they are able to lessen negative impacts from future events by foreseeing stresses and reacting hereto. This is possible by learning from past events by understanding what has worked and what has not worked in past experiences, as well as understanding what the future might look like (*Engle 2011*). Another characteristic of adaptation to keep in mind is that it does not have an end point; it resembles a constant process of adjusting to changes. Evaluation of adaptation success is unclear, and success might not become apparent for a long period. Furthermore, it is dependent on uncertain future conditions, climatic as well as socioeconomic ones that determine the effectiveness of adaptation measures (*Ford*

et al. 2013). Adaptation research has its roots in the resilience and in the vulnerability framework. However, these frameworks often utilize competing interpretations and conceptualizations, which has resulted in fragmented understandings of adaptation and what factors enable or hinder it. In order to be able to understand adaptation in more depth, there is a need to understand how these two frameworks can be united. Adaptive capacity is seen as a concept that bridges the two frameworks, as it is a common theme in both frameworks (Engle 2011). The next part outlines how adaptation is understood and how these understandings can be utilized for enhanced sustainable outcomes in adaptation.

### 2.1.1 Adaptive Capacity

Adaptive capacity is closely related to the concept of adaptation, from which it originates (Engle 2011). While adaptation can be seen as a quality of a system that enables it to become suited to the environment, adaptive capacity describes the characteristic of a system that allows it to remain in its configuration when disturbed (Callo-Concha and Ewert 2014). Adaptive capacity, on the one hand, explains how people cope with and react to change. On the other hand, it reveals an ability to experiment, learn and foster innovative solutions to anticipate future changes in complex social-ecological systems (SES) (Folke et al. 2003, Plummer and Armitage 2010). Put simply, adaptive capacity is the ability to adapt, i.e., it encompasses the conditions that allow people or groups to anticipate or react to change, to keep the consequences at a minimum, to recover from the consequences, and also to take advantage of new opportunities (Grothmann and Patt 2005).

Adaptive capacity is seen both in the resilience and vulnerability literature as an inherently good property of systems in the sense that a system cannot have too much adaptive capacity. The capacity to adapt differs between systems and contexts (Adger et al. 2007). More adaptive capacity located within a system generally equals a greater prospect of being resilient when confronted with an environmental stressor. Adaptive capacity helps to achieve the desirable states and outcomes of systems (Engle 2011). Therefore, adaptation needs adaptive capacity in institutions and social actors to cope with changes and shape the actions to deal with changes (Nelson et al. 2007, Barnes et al. 2017). Actors in this research refer to complex actors in line with Scharpf (2000) that can be distinguished from groups primarily by the pursuit of a common goal. These include mainly governmental units, such as the Ministry of Environment on the national level or on the local level, the city council, and non-governmental organizations. While the concept of adaptive capacity developed from sociology and organizational management,

where it is described as a property for organizational success, it has become an important concept within the climate change adaptation context. It is one of the few concepts linked to the framework of resilience and the vulnerability framework (Engle 2011). In the following, the two frameworks are presented, and their foci are highlighted. It is discussed how they have benefited the adaptation studies and what the perspective of each framework lacks, and how it is beneficial to use adaptive capacity as a concept that links the two frameworks to further the understanding of climate change adaptation.

### **The Resilience Framework**

The resilience framework originally stems from ecology studies. It was stressed that ecological systems are not in equilibrium but are constantly faced with stressors and ensuing changes as a response (Holling 1978). Holling (1986) developed the idea to differentiate between *engineering resilience* and *ecosystem* or *ecological resilience*, which has allowed a more dynamic and complex understanding of ecological responses to change (McIntosh 1987). Resilience is understood as the ability of a system to cope with disturbances and shocks that allows a system to remain within critical limits and to maintain its qualitative identity, structure, and functionality (Carpenter et al. 2001, Walker et al. 2004). Resilience as a concept is described as: “(...) the magnitude of disturbance that can be absorbed before a system changes to a radically different state as well as the capacity to self-organise and the capacity for adaptation to emerging circumstances” (Adger 2006, 268–269).

Understanding adaptive capacity from the perspective of the resilience framework stems from the analysis of system dynamics (Walker and Salt 2006, Folke 2006). An SES perspective allows the investigation of the interdependencies between human and natural systems, which constantly and reciprocally interact (Liu et al. 2007, Folke et al. 2016). According to Glaser et al. (2012, 4), SESs are composed of a “bio-geophysical unit and its associated social actors and institutions.” Resilience studies focus on scrutinizing the dynamics in an SES as a whole by examining the relationship between the biophysical and the human system in a two-way feedback relationship. This position treats the two systems as interdependent, integrated, and co-evolved complex systems (Folke 2006). Functional or spatial boundaries define a specific ecosystem and the problem context of it (Glaser et al. 2012). These boundaries between the system and the problem context are drawn heuristically and individually and depend on the perspective of consideration (Glaser et al. 2008). Nevertheless, the system and its environment are not treated as isolated constructs; there are close interactions consisting of an exchange of information, energy, and matter (Sawyer 2005). A defining feature of SES is their complexity, which

derives from the emergent system behavior. The emergent system behavior results from the interactions, and the respective process flows between the individual elements of the system (Egner and Ratter 2008). This behavioral complexity perspective is based on the assumption that the system behavior is not reducible to individual elements of the system and their functional relation. Consequently, there is a need to scrutinize how the system elements interact to understand the system as a whole (Ratter and Treiling 2008). Furthermore, the focus on complexity puts the focus of investigation on scales, non-linearity, uncertainty, and path dependency in the focus of analysis. The ecological and social systems are made up of subsystems, which leads to a hierarchy of systems (Ratter 2001). The subsystems consist of nested levels. In this context, the concepts of levels and scales are of importance. Scales are temporal, spatial, analytical, or quantitative dimensions that are used to measure occurrences, while the level is the unit of analysis, which is found on varying locations on a scale. For example, the social subsystem along an organizational scale is typically portrayed through hierarchical levels, consisting of the international, national, regional, and local levels (Berkes 2015) (Fig. 2). This conceptualization is utilized to assess the factors that influence the local adaptive capacity on Fuvahmulah in the remaining chapters of the study.



**Fig. 2: Multi-level governance structure (own illustration)**

The second contribution of complexity theory relevant to the study of adaptive capacity is non-linearity, which puts the focus on the fact that it is impossible to understand the behavior of these systems by the sum of the individual parts. This is shown by the fact that weak stimuli to the system can have unanticipated and radical effects, and inversely, large changes do not always have strong effects on the behavior of the system. Furthermore, non-linearity leads to path

dependency (Folke 2006), meaning that the current state of the system and its future development is influenced by events, stressors, decisions, and other factors that have impacted the system in the past. Relating to environmental changes, path dependency can cause lock-in effects, i.e., negative pathways that are not easy to break away from (Wilson 2014).

### *Adaptive Capacity in the Resilience Framework*

In the context of resilience, adaptive capacity is generally termed as *adaptability* and emphasizes the capacity of individuals and groups to affect resilience (Walker et al. 2004). Following this thought, humans shape resilience by shaping the interactions between the system's human and environmental components (Walker et al. 2006). Folke (2006) delineates that adaptive capacity allows a system to transition or transform to a new state if the system's current state is in an untenable situation. He adds that resilience has progressed from a narrow interpretation in the engineering field towards a wider understanding of ecosystem resilience, social resilience, and governance. The social science understanding of resilience has contributed the investigation of dynamic processes between the social and environmental elements and the interaction between nested scales. This conceptualization has provided more possibilities to utilize SES in analyzing adaptive capacity, as it focuses on the transformability, learning, and innovation and on integrated feedbacks of the system (Folke et al. 2005). The resilience framework has furthermore contributed the possibility to integrate ecological and institutional perspectives into understanding adaptive capacity (Gunderson and Holling 2002), which is taken advantage of in this thesis.

However, the resilience approach has been criticized for its overly strong usage of natural system concepts on social systems. In the past, the resilience paradigm has been criticized for overstating the similarities between the two systems. It has been shown that social and natural sciences have used different methods and assumptions that have led to a different development, which makes it difficult to use similar assumptions for the systems (Schultz et al. 2015, Olsson et al. 2015). A factor that has been widely criticized from the SES literature is that there have been too few possibilities to integrate the complexities of the dynamics of the social system and especially that there is a lack of scrutinizing the influence of power in SESs (Cretney 2014). In the context of this criticism, three factors have been highlighted. Firstly, one point of criticism that has been brought up is the fact that human actors have agency is not sufficiently recognized. Humans can influence their socio-environmental contexts by action and interaction; they can anticipate outcomes and learn, which has been missing in the analyses (Armitage 2005). Secondly, one of the issues in resilience research has been the understanding that communities are

discussed as being homogenous with unanimous opinions, interests, experiences, and desires. Cultural and political relationships and system structures have been lacking in understanding resilience (*Fabinyi et al. 2014*). Resilience scholars have analyzed the social aspects with a focus on homogeneity and consensus, rather than attempting to understand differences within populations and contestations (*Hatt 2013*). It is argued that competing interests and unequal power allocation within the social systems can negatively affect adaptive or transformational change, as they may hinder the mobilization of interest groups at various levels, the self-organization process of learning, and the generation of social capital (*Folke et al. 2005*). Furthermore, *Cote and Nightingale (2012)* have discussed that the lacking consideration of values, experiences, beliefs, and perspectives of those involved and affected by the management of the resources does not allow a full comprehension of the outcomes of SESs. This has resulted in the attempts to better understand the hierarchies, as well as the tensions and conflicts in communities. The focus has shifted to better understand how the local community is differentiated in different actor groups as well as interest groups and how they interact with the physical and social environment (*Fabinyi et al. 2014*). Thirdly, another weakness of assessments of adaptive capacity within the resilience framework is that scholars usually do not generalize from one study of a system to the next, therefore making it difficult to characterize and operationalize the capacity to adapt (*Engle 2011*).

An important aspect for this work is that the resilience approach offers the analytical lens to understand the interactions between social and environmental elements and, importantly, also the interaction between nested scales of a system. Elements of resilience, such as nonlinearity and surprises, provide a better understanding of these relationships. However, the resilience perspective lacks an in-depth analysis of societal complexity. It is clear that there is a need to better understand the differences in social systems and the influence of power and how these factors affect adaptive capacity on the local level, which the resilience perspective alone does not offer.

### **The Vulnerability Framework**

When a system, either ecological or natural, loses resilience, it becomes vulnerable to stressors that it would have been able to absorb before. Thus vulnerability is widely seen as the flip side of resilience (*Kasperson and Kasperson 2005*). Vulnerability is generally defined as “the degree to which a system, subsystem, or system component is likely to experience harm due to exposure to a hazard, either a perturbation or stress/stressor” (*Turner et al. 2003, 8074*). This under-

standing of vulnerability has also been termed *outcome vulnerability* (O'Brien et al. 2007). Vulnerability's main parameters are exposure, sensitivity, and adaptive capacity. Sensitivity is the extent to which the system can deal with impacts without lasting harm, and exposure is the degree to which a population is affected by a stressor (Adger 2006). In the vulnerability approach, adaptive capacity modulates between sensitivity and exposure to a disturbance. In other words, the greater the capacity to adapt is, the lower the vulnerability (Engle 2011). Adaptive capacity is seen as important for reducing vulnerability as it affects the social and biophysical elements of vulnerability and is shaped by human actions (Eakin and Luers 2006, Engle 2011). Vulnerability research has proven to be especially useful for policymakers and adaptation practitioners, as it has contributed quantifiable vulnerability indicators that are measurable and have provided generalizable knowledge on social adaptation. The resulting rankings and maps have been used to identify populations that are most likely to be affected by stressors (Cutter et al. 2003). Nevertheless, ecological aspects and the dynamic aspects of SES and human agency are often neglected in the analysis (Adger 2006, Nelson et al. 2007).

The vulnerability framework in the context of climate change has developed out of the hazards-risk field, with influences from geography, political ecology, and poverty and development fields, among others (Engle 2011). The concept of vulnerability in climate change-related studies has evolved from a focus on biophysical vulnerability with the focal point on physical systems towards social vulnerability, where a stronger emphasis is put on social systems (Brooks 2003). The former understanding was based on developing measures, from management practices to behavioral changes, that aimed to contribute to reducing negative climate change impacts with the ultimate aim of reducing the risk of negative impacts for the livelihoods of affected populations (Smit and Pilifosova 2001a). However, this approach proved to be too reductionist as it only focused on technological progress that will allow adaptation to future impacts of climate change (Dietz 2014). The latter understanding of vulnerability, social vulnerability, focuses on investigating the social construction of vulnerability and of adaptive capacity. It also stresses the structural conditions and inequities as factors that influence vulnerability (O'Brien et al. 2007). In this context, the investigation of vulnerability focuses on social conditions, including socio-economic, cultural, political characteristics, as well as governance and institutional factors that shape vulnerability (Engle 2011, Adger 2006). Scholars have criticized the lacking attention paid to how governance processes are influenced by politics and power (Agrawal 2014). The understanding of the social and political processes can be improved by approaching adaptive capacity from the social vulnerability perspective as it emphasizes an in-depth analysis of power relations as a result of the influence of political ecology (Robbins 2019).

However, gaps remain that consider the knowledge on how power and power relations shape climate change adaptation and vulnerability. There needs to be increased understanding that the process of adapting to climate change is not only considered to be a reaction towards climate change effects, but rather a social and political process that can have diverse results (*Eriksen and Lind 2009*). These considerations are a fundament on which the thesis builds in order to scrutinize the ways power and politics are manifested in adaptation processes.

### **Power Relations**

Concerning the investigation regarding the role of power, discourses, and narratives in environmental policy, political ecology is a central field of research which is why the following elements of its analytical approach are integrated into the analysis framework. *Bauriedl (2016)* argues that the fundamental perspective of political ecology scholars is to scrutinize the co-production of society and nature. *Dietz* (as cited in *Ulloa 2018, 225–226*) argues that “an approach to concepts of vulnerability and adaptation that privileges the political has to focus on the configuration of relations and political processes historically and currently determined by such relations between society and nature, as well as the political management of the climate.” By taking a non-determinist approach, political ecologists scrutinize the ontological grounding of climate change adaptation (*Taylor 2015*). Recent developments have shifted the field to a more discursive and material focus, with scrutinizing the role of power along with the link between the social and ecological systems and understanding the influence of power and discourses on the outcomes of SESs and on vulnerability (*Ingalls and Stedman 2016*). Highly influenced by the work of *Michel Foucault* and the poststructural theory, the focus is on understanding how discourses and narratives influence how humans perceive the environment and how their behavior is influenced (*Fabinyi et al. 2014*). Through the analysis of power, normative aspects of adaptation can be scrutinized, asking who should be ruling, for what purposes, and under what conditions (*Ostrom 2005*). In this study, *Paulson et al.’s (2003)* understanding of power is followed. The authors “conceptualize power as a social relation built on an asymmetrical distribution of resources and risks and locate power in the interactions among, and the processes that constitute, people, places, and resources.” (*Paulson et al. 2003, 205*) Discourses take an important role in the way the environmental problems are addressed, as discourses shape the way environmental problems are perceived and assessed (*Hajer 1995*). According to *Hajer (1995, 44)*, discourses are “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”. Discourses influence norms, values, and beliefs by determining how phenomena, social as well as physical, are conceptualized. The patterns that

are created by discourses shape how practices and events in environmental governance are understood, and in consequence, they are important for the expression of political truth claims and how individuals and collectives position themselves towards decisions (*Leipold and Winkel 2017*). Discourses dictate what are seen to be right and wrong answers to environmental problems, i.e., what is normal and abnormal. With these considerations in mind, the aim of investigating the power relations is to consider political conditions and relationships that have historically shaped and currently shape the way environmental governance is acted upon in the Maldivian context and thereby influence the capacity to adapt.

A growing number of studies look into how the political context and political power relations on and between different levels and how discourses influence the vulnerability of affected populations as well as adaptation strategies and outcomes (*Eakin and Lemos 2010, Adger et al. 2009b, Ratter 2008*). On the international level, it has been increasingly scrutinized how politics are embedded in the international climate change discussion. *Webber (2013)*, for example, has demonstrated how developing countries make use of *performative vulnerability* in this context to attain financial aid from international donors. Another focus of studies has been on discussing the power disparities related to climate change adaptation between the Global North and the Global South. Adaptation measures are still highly dominated by international donor organizations and the countries of the Global North, who are the main financial donors. For example, the global climate change policy agenda has been dominated by the countries of the Global North, whereby the needs and interests of lower-income countries have been neglected (*Blicharska et al. 2017*). On the national level, authors have been discussing the disparities within the countries of the Global South, where top-down processes dominate the process of adaptation and reinforce center-periphery inequalities. Often central national governments and elites take control of the adaptation processes (*Morchain 2018*). *Nightingale (2017)* has shown in a case study how power not only influences the outcomes of adaptation but additionally how it determines which measures are adopted, what institutions are proposed, who is seen to be capable of managing environmental change, and who gets support for adaptation projects. Furthermore, *Nightingale (2017, 14)* stresses that “Adaptation programs in politically contentious contexts (...) cannot be assumed to be based upon objective evaluations of biophysical threats and needs, but rather are deeply bound up in contested understandings of whose needs and desires should be prioritized in development efforts.” Others have highlighted how politicians frame climate change to their political and personal advantages (*Shove 2010*). On the local level, *Ulloa (2018)* shows that proposals by national governments that do not consider the cultural differences that manifest themselves on the local level will be unable to address the needs

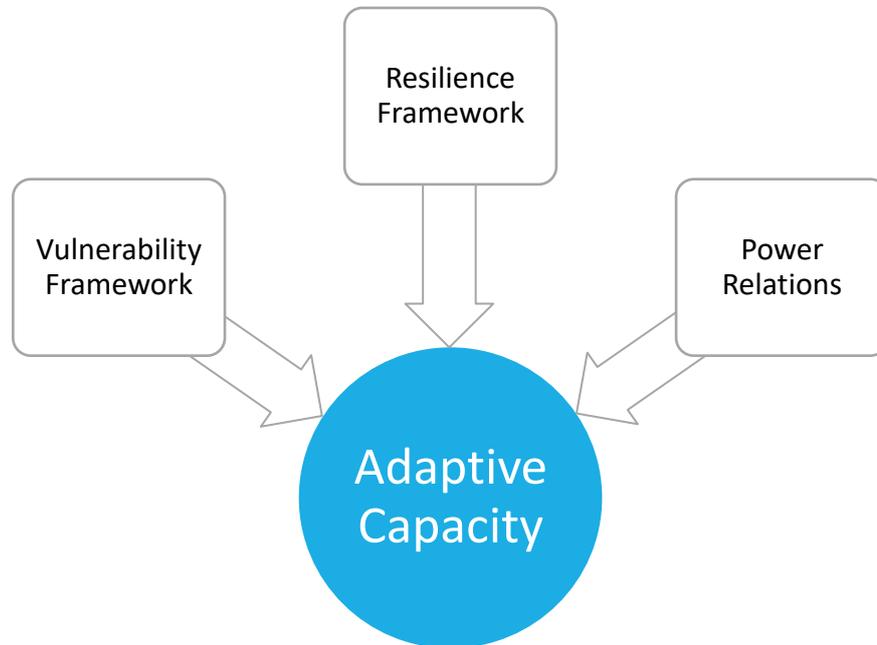
in the local context. It has been discussed that power and its distributions influence the way risks are assessed and handled in decision-making processes in adaptation contexts (*Ayers* 2011, *Granderson* 2014). In order to be able to translate the concept of adaptation into practice, it is necessary to understand how different groups involved understand adaptation as well as the historical context that shapes the interaction of people with climate change and its impacts (*Morchain* 2018). It has been shown that the most vulnerable groups, such as women, are often neglected in the decision-making process.

One recurring theme on the three levels discussed above is that local knowledge and preferences of the affected populations are neglected, leading to imperfect adaptation results. In the opinion of *Bauriedl* and *Müller-Mahn* (2018, 285): “Understanding adaptation as human agency requires taking into account different forms of knowledge, environmental perception, cultural backgrounds of values and norms, contested settings of interests, and the institutional regulation of societal decision-making.” In line with the above-mentioned scholarship, it becomes apparent for this work that it is necessary to include the political and cultural aspects when trying to understand how and why decisions are made on the different levels and to be able to assess these in the climate change adaptation context. Therefore, adaptive capacity on the local level can only be understood when scrutinizing the influence of political and cultural factors on the involved actors and their actions and decisions, which is allowed through a governance perspective. This is discussed in the next section.

### **2.1.2 Advancing Adaptive Capacity: Combination of the Frameworks**

While the resilience framework allows scrutinizing the dynamic processes within an SES and focuses on contexts in assessments of adaptive capacity, the vulnerability framework provides the integration of social factors into the analysis and offers the basis for operationalization (*Engle* 2011). The linking of vulnerability and resilience literature and the benefits of this linkage in the assessment of adaptive capacity has been highlighted by a number of authors (*Engle* 2011, *Cutter et al.* 2008). *Engle* (2011) raises a number of arguments for a stronger focus on adaptive capacity as a concept linking the resilience and vulnerability perspective for assessments: Firstly, adaptive capacity is an outright positive attribute and, secondly, one that is shapeable by humans. And lastly, it is already embedded within both frameworks. A main similarity between the frameworks is how adaptive capacity is highly determined by governance and institutions in both and allows a deeper understanding of adaptive capacity (*Cinner et al.*

2018, Engle 2011, Agrawal 2008). While power relations are partly integrated into the vulnerability framework, there is a need to specifically investigate the influence of power on the issue at hand to get a comprehensive understanding (Fig. 3).



**Fig. 3: Linking of frameworks (own illustration)**

Engle (2011) proposes an approach towards a better and more complete assessment of adaptive capacity, and that helps to narrow the research gaps. This approach integrates aspects of the resilience and vulnerability framework and focuses on the dynamic processes that shape adaptive capacity and SES, as well as identifying variables that contribute to adaptive capacity. He points to four aspects that support this undertaking, by focusing on measuring and characterizing adaptive capacity that firstly, put management, governance, and institutional analysis in the forefront; that secondly, seek to focus on the latency issue by measuring the capacity to adapt ex-ante and ex-post of stressors; that thirdly, allows assessing adaptive capacity in systems on the basis of variables; and fourthly, can be utilized for policy development as well as be case-specific.

### **2.1.3 Governance and Adaptive Capacity**

Adaptive capacity assists in attaining desirable states of the system. Adaptive capacity is not equally distributed and varies between different systems and contextual settings (Adger et al. 2007). It is, therefore, significant to understand what factors and aspects enable or hinder the building and enabling of adaptive capacity (Adger et al. 2009a). From a social systems perspective, determinants of adaptive capacity include the availability of a number of resources, including technical, financial, social, institutional, information, as well as the social structures

and processes that mediate the resources, such as governance (*Plummer and Armitage 2010*). Governance and institutions are identified as key determinants of adaptive capacity (*Eakin et al. 2011, Engle and Lemos 2010, Gupta et al. 2010*). Both the vulnerability and resilience framework stress the importance of governance and institutions to influence adaptive capacity (*Cinner et al. 2018, Engle and Lemos 2010, Agrawal 2008*). Furthermore, governance offers a bridging concept to bring the different conceptualizations of adaptive capacity together, providing leeway for new insights (*Engle 2011*). The following part delves into the meaning of the concept of governance and its development, its linkages to adaptive capacity, and finally, illustrate the variables of governance that allow the assessment of adaptive capacity in the context of dealing with coastal issues on the local level.

In general, governing is understood as directed behavior that aims to solve a problem or take advantage of the possibilities that a problem brings (*Huitema et al. 2016*). Governing “can be considered as the totality of interactions, in which public as well as private actors participate, aimed at solving societal problems or creating societal opportunities; attending to the institutions as contexts for these governing interactions; and establishing a normative foundation for all those activities.” (*Kooiman 2013, 4*) It is seen to be vital for climate adaptation (*Abram et al. 2019, Smit and Pilifosova 2001b*). Governance defines the processes and structures by which societies shape individual and collective actions and share power (*Young 2009*). It furthermore steers the way actors share responsibilities and negotiate their interests with others (*Forino et al. 2015*). *Williamson (2000, 599)* has called governance the “effort to craft order” and it can be employed through administrative, legal, and other forms of social processes. Governance deals with the ways social, political, economic as well as environmental systems and the interactions between them are guided by establishing and changing organizational as well as institutional arrangements that regulate social processes and mitigate conflicts (*Paavola 2007*). Hereby, governance regulates the distribution of power and consequently also influences decision-making (*Graham et al. 2003*). Central to the term governance is the shift of the focus on state and international organizations in regard to managing issues towards the understanding that these actors share the activity of governing with other groups in society (*Bevir 2013*). A better understanding of governance can be achieved when showing the differences between the concepts of governance and government. *Healey and Robinson (1994, 163–164)* clarify that governance “refers to the use of legitimate authority exercised in the application of government power and in the management of public affairs (...). It is embodied in institutional arrangements, consultative mechanisms, policy-making processes and the nature and style of leadership in a political system.” Government is defined as “the exercise of influence and control,

through law and coercion, over a political community, constituted into a state within a defined territory.” (*Healey and Robinson 1994, 163*) Following this thought, a government can be seen as one of the actors in a governance structure. The term governance is also made clearer when comparing it to management. According to *Béné and Neiland (2006)*, management deals with the implementation of actions and decisions according to rules and is about action, while governance deals with the sharing of power and responsibilities and establishing the objectives as well as the policy agenda.

Governance of adaptation looks at these arrangements in the realm of climate change adaptation. Governance activities deal with “ideas about appropriate normative underpinnings for the way climate change adaptation should be governed, taking into account wider social and political beliefs and systems.” (*Huitema et al. 2016, 37*) Governance includes efforts to found institutions that deal with climate change adaptation issues (*Huitema et al. 2016*). Institutions are structures that frame, facilitate and shape social action. Institutions, together with organizations, form the governance structure by creating and reinforcing them (*Coase 1998*). Institutions have significant power to influence the behavior of the actors and enable reflexive actors to act in a competent manner while at the same time limiting their scope for action. They are practices that are shared through individuals and by which the individuals address their mutual interdependencies (*Paavola 2007*). Institutions include formal institutions ranging from laws, regulations, protocols, and informal institutions such as traditions, norms, or habits. With regard to global change, norms are the “shared and internalized understandings by those involved about the ‘do’s and don’ts’ involved in particular situations.” *Cole and McGinnis (2017, 228)* Informal institutions are not present in a codified form; they are institutionalized by habituation, not through conscious decisions. Informal institutions are the basis of regular actions and action limitations and are seen to be more effective than formal institutions (*North 2005*). Humans are social beings, and therefore their interactions and organization are shaped by social processes and institutions, like behavioral characteristics and norms (*Ostrom 2005*). In the context of stresses, this means that social environments play a role in how individuals act and respond (*Adger et al. 2009a, Agrawal 2008, Crawford and Ostrom 1995*). It is thus likely that adaptation action is shaped by overlapping social processes governing it. Processes will likely influence how individuals act in regard to adaptation (*Jones and Boyd 2011*). Governance is furthermore influenced by politics, which include the “interactions and substantial accounts by which individual and collective actors struggle for the definition and the provision of the common good.” (*Voß and Bornemann 2011, 9*)

## Conceptual Framework: Local Adaptive Capacity

Governance in the realm of adaptation stresses phenomena that are characterized by being multi-jurisdictional and hybrid and also include multiple stakeholders on various levels. Governance and institutions are present in SESs on local, regional as well as global scales (*Pahl-Wostl* 2019). These SESs exhibit complex relationships of the numerous involved actors and the processes and interactions between them, making adaptation a dynamic societal process, where governance and institutions play an important role (*Smit and Wandel* 2006). *Osbahr et al.* (2010) have remarked that cross-sectoral, cross-scale, and cross-level efforts in adaptation are necessary to enhance the resilience of communities at risk from climate change impacts. The aspects of multiple levels in governance further stress the integration of actors on multiple levels with power and responsibilities distributed among them (*Araos et al.* 2017). The multi-level aspect of governance implies that these levels do not necessarily have to be formally dependent on each other, i.e., there does not generally have to be a direct chain-of-command relationship between the levels. However, the actors on the different levels interact and influence another and therefore have an effect on the act of governing (*Bache et al.* 2016). Governance can include diverse actors and groups of actors on multiple levels, including state and non-state actors that represent various beliefs and interests (*Duit and Galaz* 2008), including:

- governments on various levels (e.g., through laws);
- local actors governing themselves through customary law (e.g., norms and regulations regulating common pool resource);
- private sector actors (e.g., insurance companies);
- multiple actors on multiple levels working collaboratively (e.g., UNFCCC);
- multiple countries working together (e.g., Antarctic Treaty) (*Abram et al.* 2019) (Fig. 4).

It is widely acknowledged that governments on all levels influence adaptation processes (*Biesbroek et al.* 2013). In the adaptation process, these multiple levels of government need to be coordinated so that actions will not result to be fragmented or maladaptive (*Araos et al.* 2017).

It is discussed that some governance arrangements are more appropriate than others in different situations (*Ekstrom and Young* 2009, *Galaz et al.* 2008). The issue of *governance fit* describes the matter when an institution or a group of institutions insufficiently or inadequately consider the functionality, nature, and/or dynamics of the ecosystem that the institutional arrangement influences (*Ekstrom and Young* 2009). A consensus has been building among scholars that a top-down, one-size-fits-all approach to the governance of environmental problems has immense

shortcomings dealing with uncertainty and nonlinear behavior (*Meinzen-Dick 2007*). Amongst others, they are seen as reactive, exclusive, and unable to react to changing situations (*Pahl-Wostl et al. 2007, Pahl-Wostl 2007*). Local-level adaptation activities are seen as increasingly important for sustainable outcomes, as adaptive capacity and adaptation are intrinsically local and context-specific (*Adger et al. 2004, Krauss 2016*). Adaptation can be implemented by local activities performed by private actors. However, in order to achieve collective objectives, there needs to be coordination among households, organizations, and regions (*Huiteima et al. 2016*).



**Fig. 4: Actors and other groups in multi-level governance structure (own illustration)**

Many private and public actors are involved in local climate change adaptation with various interests, beliefs, knowledge, and resources (*Termeer et al. 2012*).

In order to achieve effective outcomes in adaptation, good governance has been identified to be critical. Empirical evidence on what good governance is in regard to adaptation to climate impacts highlights aspects such as reflexivity, responsiveness, fairness, social learning, co-production of knowledge, respect for cultural and ethnic diversity, and inclusivity (*Abram et al. 2019*). There is still little evidence of which governance arrangements fit best for a specific context. Various approaches to governance, such as adaptive governance, collaborative gov-

ernance, or co-management (*Folke et al. 2005, Chaffin et al. 2014*), have emerged that all similar stress characteristics, such as collaborative, learning-based, and emergent aspects in governance (*Cosens et al. 2018*). Importantly, they also focus on making collective action possible, which can facilitate adaptive actions to changes both foreseen and unforeseen (*Cosens et al. 2018*). According to *Lebel et al. (2006)*, societies need specific requirements to be able to adopt these types of governance approaches. On the one hand, adaptive governance demands a number of elements of good governance, including accountability, participation in processes, as well as polycentric and multilayered institutions. On the other hand, society must have the capacity to manage resilience. This includes the means to deal with nonlinearities and surprises, be capable of designing institutions that fit the ecological and social context, be able to use varying knowledge forms, and be able to navigate thresholds, amongst others.

Importantly, there are possibilities to alter the functions and structures of institutions and thereby change how affairs are conducted (*Dovers and Hezri 2010*). Firstly, reforms encompass modifications, which can include changes to the distribution of power or introducing alterations to the decision-making power among involved actors. One example of such a reform is decentralization, which alters the distribution of power through law. Decentralization's objective is to deliver services at a lower level, as it is argued that decentralized structures deliver services that match the demand better. According to *Ribot (2002)*, one can differentiate between *administrative decentralization*, i.e., the transferring of power of a ministry of the central state towards local branches, and *democratic decentralization*, i.e., any act of the central government formally transferring power to institutions and groups at the lower level. In this work, decentralization references the latter definition. Decentralization is especially seen to be important for developing countries as it is supposed to improve the provision and maintenance of services and infrastructure. Secondly, mechanisms affect governance processes. Changes to mechanisms can, for example, include improving the distribution of information among actors or changes to the participation of actors (*Biesbroek et al. 2014*). *Engle (2011)* argues that a focus on adaptive capacity can support understanding aspects of governance and institutional dimensions regarding the system in order to create effective governance of environmental problems. On the same note, *Plummer and Armitage (2010, 10)* argue that adaptive capacity is a "critical enabling factor in efforts to build multilevel governance systems for complex social-ecological systems." Assessing adaptive capacity can therefore be useful for understanding and overcoming barriers to adaptive capacity that have been identified by scholars, which is discussed in the following.

### **Governance Barriers to Adaptive Capacity**

The concept of *barriers to adaptation* has looked into adaptive capacity, in which barriers are discussed as causes for low adaptive capacity (Eisenack and Stecker 2012) or hindrances to turning the capacity to adapt into successful adaptation (Adger et al. 2009a, O'Brien et al. 2006, Eisenack et al. 2014). Diverse aspects related to governance have been identified that negatively affect adaptive capacity. These include institutional barriers such as poor coordination between organizations that are responsible for planning and implementing adaptation measures, which is especially apparent in developing countries (Betzold 2015, Spires et al. 2014) or strong dependence on donor funding and their agendas (Nunn 2013), or inadequate awareness of climate change issues on all levels of the governance system (Arnall and Kothari 2015). Other governance barriers include resource barriers, such as lacking financial or human resources. However, there has been little academic focus on identifying the relationship between community participation in adaptation and multi-level governance (Cinner et al. 2018, Newig and Fritsch 2009). Some studies have looked into how barriers affect the willingness of the community to participate in adaptation measures. For example, Roncoli et al. (2011) have shown how cooperation and the willingness to participate were hindered due to cultural differences in participation in meetings between locals and outsiders. Newig and Fritsch (2009) highlight that participation of the community must always be connected to the issue of governance because community participation takes place at specific levels, which are generally the local or regional levels and interlinked with higher levels of governance. The governance structure enables participation or hinders local people from partaking in decision-making on how actions should be taken, contributing to policy strategies, and voice their interests. National state actors are capable of hindering or enabling the involvement of the community in multiple ways. Higher levels of governments have the constitutional responsibilities as well as the political instruments that give them the power to ensure climate change adaptation will actually happen (Araos et al. 2017, Jordan 2015). On the one hand, national governments are seen as the nexus for the planning of adaptation activities, for determining policy priorities, and for resource and support distribution (Hanger et al. 2013). The state has the power to create a positive environment for the reaction to climate change impacts. It has been shown that the national authorities play a major role in creating and facilitating national adaptation policies that make it easier for lower levels of government to develop and initiate adaptation policies (Amundsen et al. 2010). On the other hand, national governments are also able to create conditions that constrain the adaptation to climate change, such as by under-reacting to climatic changes or by designing conflicting guidelines or conflicting tools (Peters et al. 2017). Also, national governments are not necessarily interested

in assigning responsibilities to lower levels, often due to financial and power interests. However, activities by actors on the national level are shaped by dependencies and commitments to international agreements and are also influenced by activities and preferences by actors on the local level and others. Scholars have shown that communities can be limited in their adaptive capacities because they cannot always act collectively, which is influenced by factors such as trust, social capital, and others (*Pelling and High 2005, Adger 2003*). Studies from the management of commons have shown that the perception of the community of governance arrangements can influence the resource use behavior (*Warner and Pomeroy 2012, Gelcich et al. 2008*). Perceptions by community members also influence the levels of support for a management approach, the compliance with regulations, and also the willingness to get involved in the decision-making process (*Mora et al. 2009*). In this regard, the need to consider the heterogeneity of communities is increasingly acknowledged (*Paveglio et al. 2012*).

Furthermore, the community and lower levels of government are rarely capable of planning adaptation measures on their own due to technical, financial, and human resource limitations and are therefore highly dependent on national authorities. *Cinner et al. (2018)* argue that there needs to be a better understanding for understanding key linkages and feedbacks between scales, between social and ecological domains, and between domains of adaptive capacity. They specifically call out larger-scale social dynamics like governance that create a political or social context that allows or hinders adaptation at smaller scales (*Cinner et al. 2018, Morrison 2017*). Based on these contemplations and the identified gaps within the scholarship, this work specifically looks into how the multi-level governance structure – with a special focus on political influences – enables or hinders the adaptive capacity of the actors and groups on the local level, i.e., the possibilities and the willingness to be involved in adaptive activities.

It has been discussed that resolving barriers by identifying and exposing the factors that stop, divert or delay the adaptation process will be positive for the outcomes of adaptation processes (*Berkhout 2012, Moser and Ekstrom 2010*). However, *Biesbroek et al. (2014)* have shown that scholarship on resolving barriers has not yet brought any clear benefits to adaptation initiatives. The research on how barriers emerge and persist is not sufficiently understood. There is only a limited number of studies focusing on discussing the emergence and persistence of barriers (e.g., *Azhoni et al. 2017, Eisenack et al. 2014*). By identifying the factors that enable or hinder local-level adaptive capacity, this work is able to add insight into factors that lead to the emergence of barriers. Especially knowledge on the barriers that emerge from cultural, socio-economic, and political factors is lacking (*Shackleton et al. 2015*). These deficiencies in research

on barriers make it difficult to design successful adaptation strategies (*Oberlack 2017*). However, according to *Moser and Ekstrom (2010)*, a number of features will be advantageous to overcome barriers that include a collaborative, creative, strategic approach with leadership and effective communication.

### **2.1.4 Assessing Governance Aspects of Adaptive Capacity and Mobilizing it**

In an analysis of the concept of *adaptive capacity*, *Mortreux and Barnett (2017)* have identified two generations of understanding adaptive capacity in climate change. The first generation of studies has focused on the availability of social entitlements and material assets, where a higher availability of assets was viewed as conterminous with better opportunities to adapt to climate change. This approach was utilized, for example, in the Third Assessment Report of the IPCC. The second-generation research on adaptive capacity looks at the capability and the willingness to convert resources into adaptive action (*Cinner et al. 2018, Mortreux and Barnett 2017*). In the face of increasing coastal risks, assessing coastal communities' adaptive capacity is becoming increasingly important for actors in the adaptation arena, including policymakers, planners, and researchers (*Wong et al. 2014*). There are multiple approaches to assessing adaptive capacity that reflect diverse interests, theoretical rationales, and areas of expertise (*Whitney et al. 2017*). *Fabinyi et al. (2014)* have argued that in order to make the assessment of adaptive capacity appropriate, the question needs to be studied what actors or groups adapt to which change or stressor, which is associated with resilience assessments. Furthermore, it must be made clear how one defines the adaptive capacity and the approach taken. A number of scholars have remarked that a comprehensive understanding of the socio-economic systems, as well as the political influence concerning adaptive capacity, is necessary (*Engle 2011, Plummer and Armitage 2010, Armitage 2008*). Other research has put effort into understanding how governance and institutions impact adaptive capacity (*Brockhaus et al. 2012, Gupta et al. 2010*), with some focusing on the local level (*Celliers et al. 2020*). As a result of this research, authors have mapped out a catalog of variables regarding the assessment of adaptive capacity based on governance and institutional literature (*Brockhaus et al. 2012, Gupta et al. 2010, Engle and Lemos 2010*). This study utilizes this literature, enriched with aspects derived from climate change adaptation and coastal adaptation literature as well as further literature on governance and adaptive capacity, to develop variables that are used to depict their influence on the local adaptive capacity in Fuvahmulah in chapter 5. The variables are presented in the following on the basis

of the two main threads of governance variables, the individual and organizational understandings and social organizational characteristics that influence a system's capability of producing desired adaptation outcomes, which are based on research of *Brockhaus et al. (2012)*.<sup>1</sup>

### **Individual and Organizational Understandings**

Individual and organizational understandings of risks and preferences and the resulting favored pathways to adaptation are highly influenced by a mix of experiences, perceptions, and knowledge of the diverse groups of actors and are of significance to understanding adaptive capacity (*Otto-Banaszak et al. 2011, Engle and Lemos 2010*). Social contexts influence the perception of risks and the preference of adaptation options (*Adger 2006*). For example, *Nunn et al. (2017)* have shown that in Pacific island countries, people prefer coastal adaptation measures from international donors and engineering companies to those of their own culture. Furthermore, the understanding of adaptation approaches is guided by interests from the involved actors, as well as by discourses and power relations. These aspects are discussed along with the following variables.

#### *Experience and Dealing with Environmental Stressors*

Adaptive capacity is influenced by the way the system has been under stress in the past and how it reacted during and in the aftermath of the event. There will be lessons learned for a system in the way it has reacted to past events and in the degree remedial actions that were adopted were successful or not (*Shi et al. 2016*). This can furthermore lead to a more flexible approach to future stress events. The way a system coped with a stressor in the past is furthermore an indicator for the ability of institutions to be flexible, i.e., how the system was able to deal with stressors without collapsing (*Engle and Lemos 2010*). Risk is experienced and created by interactions among people and the values they share (*Breakwell 2014*). Furthermore, the sharing of this information and experience within the system increases the capacity to adapt (*Engle and Lemos 2010*). For example, experience helps to learn from past mistakes and improve the responses during future events (*Finlayson and McCay 1998*). This means that (1) the more experience a system has gained, (2) the more the system has learned from this experience, and (3) the more information about the gained experience is shared among the various actors, the higher the adaptive capacity of the system (*Brockhaus et al. 2012, Engle and Lemos 2010*).

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<sup>1</sup> While *Brockhaus et al. (2012)* focused their research on forest ecosystem goods and services, the threads were found to be practicable after being extended and adapted for guiding research on the assessment of adaptive capacity in the context of coastal governance.

### *Risk and Problem Perception*

The perceptions of risk by the involved actors have been shown to shape adaptive capacity. Perceptions and sense of urgency are shaped, amongst others, by experiences, beliefs, and knowledge of the actors (*Wolf and Moser 2011, Leiserowitz 2006*). This diverse set of factors shapes the way people believe that the problem is controllable and how the problems should be addressed. For example, *Lee et al. (2015)* have shown how the political polarization in the United States of America has influenced the perception of the risk climate change poses. Risks that need to be adapted to are often presented as objective facts. However, this information is often selected and interpreted by actors, and discourses are used to shape the opinions of actors that are involved in the adaptation arena regarding what options are desirable and implementable (*Armitage 2008, Lakoff 2010, McEvoy et al. 2010*). In climate change adaptation studies, this refers to aspects such as including the attribution of priorities to climate change given on the different levels of the system, the controllability of climate change as viewed by various actors, and what responses are being discussed by the actors on the various levels. *Armitage et al. (2017, 3–4)* highlight the need to understand “the values that frame decisions about desired responses to social and ecological threats to local ecosystems and livelihoods.” These factors shape what the individuals and the collective judge to be appropriate or desirable responses to the stressor, and these can be highly different in the system regarding the levels, sectors, genders, and age groups (*Grunblatt and Alessa 2017*). The more decisions are based on a multitude of sources, including scientific and evidence-based knowledge as well as local knowledge, which has to be available, accessible, and used on the local level, and the more decisions are made transparently and evidence-based and inclusive of the diverse actors, the higher the adaptive capacity (*Grunblatt and Alessa 2017, Castree et al. 2014*).

### *Comprehension of Responsibilities for Action and Policy Preferences*

Thirdly, adaptive capacity is also impacted by the allocation of the roles and responsibilities in adaptation activities as experienced by the actors in the system. This also applies to policy preferences. The conviction that the governance structure and the institutions are capable of fulfilling the necessary tasks leads to the support of and commitment to the governance system (*Runhaar et al. 2017, Engle and Lemos 2010*). Depending on these understandings and the acceptance of the governance system, the actors believe to be responsible for adaptation activities or not. Perceptions influence the feelings concerning self-efficacy as well as the perception of whether one’s actions are likely to have a positive effect or not (*van Valkengoed and Steg 2019*). The acceptance of the governance system is also related to the acceptance and recognition of leadership, which is important with regard to giving purpose, managing conflicts, as well as

building trust. Leaders can take various forms, including bridging and boundary organizations, facilitators, and organizations (*Berdej and Armitage 2016, Folke et al. 2005*). On another note, trust within the system, i.e., between the individual members of the system in the powerful organizations, increases the likeliness of support of the governance structure and thereby increases the cooperation with the authorities (*Cordasco et al. 2007*). The higher the trust in the governance structure, institutions, and involved organizations and actors, as well as in the acceptance of the allocation of roles and responsibilities, the higher the adaptive capacity will be (*Brockhaus et al. 2012*).

### **Social Organization**

Another variable group that influences the adaptive capacity on the lower level is social organization. Scrutinizing the social organization furthers the understanding of the relationships between actors and groups on and between the various levels regarding the degree of relation patterns and integration (*Barnes et al. 2017, Ingold and Balsiger 2015, Engle and Lemos 2010*). It encapsulates how groups are organized to facilitate or impede collaboration and sharing of available knowledge (*Cinner et al. 2018*). There has been an increasing discussion on how the organization of social relationships enables and hinders sustainable environmental governance, where the nature of relationships and the exchange of resources are important factors for influencing adaptive capacity. It has been shown that the relationships can increase the adaptive capacity of communities by contributing towards the connectivity between actors that are part of the adaptation process (*Engle and Lemos 2010*). Collective action is highly dependent on information and knowledge flow between actors and other relevant groups (*Adger 2003*). Factors in the realm of social organization that lower adaptive capacity are cases where power distribution is highly concentrated and where some groups are marginalized. Other factors include the lacking distribution of knowledge and information (*Wolf et al. 2010*). Variables associated with the social organization are investigated below.

#### *Collaboration and Power Distribution*

The way actors feel responsible, with whom they collaborate, and with whom they are able to collaborate has implications on how the actors are capable of responding to environmental issues. Horizontal and vertical links among actors create opportunities for collaboration, making decisions, and establishing a foundation for shared values and interests. Multi-level participatory processes lead to an integration of various actors and their perspectives that can help in building social capital (*Berkes 2007, Béné and Neiland 2006*). However, effective collaboration

between actors with different backgrounds needs time to develop (Raab et al. 2015). Elite capture and monopolization and other forms of asymmetry of power distribution can limit successful adaptation and the equity of adaptation and can exclude community members from the participation in the planning and implementation of adaptive measures (Harrison and Chiroro 2017, Tschakert et al. 2017, Tschakert et al. 2013). The fairer the distribution of power and influence is among the groups involved in decisions on the various levels, the greater the adaptive capacity is (Brockhaus et al. 2012).

### *Availability and Sharing of Knowledge and Information*

Appropriate responses to environmental stress require high levels of information use and exchange to be effective. These factors make it more likely that different perspectives are obtained that can generate new knowledge collectively and inform the decision-making (Berkes 2015, Evans 2010). Informed individuals and organizations interacting with one another on all levels are highly important in governance to be able to respond to stressors (Armitage and Plummer 2010, Folke et al. 2005). While knowledge is an essential element for all governance variables, it is necessary to analyze how knowledge and information are available on the various levels, who can access it, and how it is distributed (Matouš et al. 2013). The origin of information and knowledge can vary highly and can encompass so-called expert knowledge as well as local environmental knowledge (Armitage and Plummer 2010). For example, information and knowledge about alternatives to the current adaptation approach, including predominating paradigms, narratives, or discourses, can lead to innovative and improved management systems (Bayard et al. 2007). Effective adaptation demands knowledge and information on all levels and the sharing of these among the actors on all levels (Grunblatt and Alessa 2017). In the context of assessing adaptive capacity, these insights indicate that the higher the use of various kinds of knowledge and information and the sharing among the various groups, the higher the adaptive capacity will be (Berkes 2015, Bayard et al. 2007).

As this study focuses on the actors and groups on the lower level of the governance system and is particularly interested in understanding the heterogeneity of the affected community with regard to interests and opinions regarding the dealing with coastal issues, the following part develops an approach to analyze the community-specific characteristics for adaptive capacity.

## **2.2 Communities and Place**

Communities are central to adaptive capacity on the local level. Communities are increasingly recognized to be important for adaptation. A number of concepts have developed in the adaptation and development literature with varying foci yet with a similar focus on understanding

how populations that are or will be affected by climate change impacts can be integrated into adaptation approaches in order to increase their resilience and reduce their vulnerability (*Matarrita-Cascante et al. 2017*). Adaptation scholarship and development agencies increasingly look at integrating the affected community in the planning, implementation, and monitoring stages of adaptation measures (*Hafezi et al. 2018, Burton and Mustelin 2013*).

Studies have shown that the stronger consideration of the perceptions and interests of groups on the local level leads to improved acceptance of decisions and swifter implementation and compliance with adaptation measures (*Newig and Fritsch 2009*). However, different communities have a differing capacity to adapt to environmental changes (*McNamara et al. 2019, Nunn and Kumar 2018*). *Adger (2010)* discussed that differences between communities in the conception of risk and responses to it are influenced by shared social contexts at small geographical scales. Factors such as demographic aspects, place attachment, and relationships and interactions within the community have been shown to enable or also hinder collective action. However, a criticized aspect in adaptation studies focusing on the local level has been the lack of conceptualization of community or a simplistic view of community and neglecting plurality within communities (*Berkes and Ross 2013*). *Paveglio et al. (2017)* have highlighted that studies that focus on community lack the consideration of the local context, which they see as highly formative for adaptive capacity. Policies and plans formulated on higher levels addressing impacts of climate change often only focus on technical solutions and fail to integrate subjective and emotional links between the people and the space they live in in the planning (*Agyeman et al. 2009*).

*Wilkinson (1991)* explicitly stresses the local surrounding as an important aspect for the development of community action. *Wilkinson (1991, 24)* states that: “characteristics of local settlements are important indicators of social interaction”, which highlights the importance of literature on place attachment (*Paveglio et al. 2009*). *Paveglio et al. (2017, 2012, 2009)* have further developed a stronger focus on place and place attachment in the context of understanding community action. While their research has been focused on identifying the social context of community and collective action in the context of Wildland Urban Interface, it offers a conceptual framework to understand the context for local adaptation. Place attachment has been shown to be an important factor for community resilience (*Amundsen 2012, Berkes and Ross 2013*). The concept of place attachment analyzes the way individuals are emotionally connected with a place encompassing a feeling of belonging through social networks as well as the physical space. Consequently, it discloses what individuals value. The scholarship recognizes that place

attachment can influence the willingness of individuals to get involved in adaptation measures in order to maintain the values that they attribute to the place or to behavior that is positive for the environment (Amundsen 2015). It is argued that local adaptation is more likely to be successful if people are emotionally and practically tied to the physical space which they inhabit (Paveglio et al. 2009, Kemmis 1990). Paveglio et al. (2009, 1088) argue that “capacity for dealing successfully with emerging problems is moderated by the relationships people have with their locality and to each other.” According to this perspective, community action emerges in the face of a common issue when individuals decide to address the problem collectively and act together and mobilize resources, which is termed as the *emergence of a community field* by Wilkinson (Paveglio et al. 2017, Kemmis 1990). Communities and individual responses to changes are defined by their values and perceptions of particular places (Adger et al. 2012, Fresque-Baxter and Armitage 2012). While this conceptualization offers a suitable analytical lens through which it can be assessed how place and relationships lead to the emergence of a community field, a missing factor that this work aims to reveal is the effects of external factors and the influence of multiple levels on the emergence of community action.

The political context, among other external factors, can affect the values and perceptions of the community members and thereby influences the emergence of community action. For the study, it is of significance to include the conceptualization of community by Paveglio et al. (2017, 2012, 2009), supplemented with the understanding of external factors, as it allows to understand how place attachment leads to adaptive action in a community, which is analyzed for Fuvahmulah in part 5.4. It enhances this study by obtaining a deeper insight into the adaptive capacity of the local level when combined with the governance factors that were identified to be of relevance in chapter 2.

In the following, the term community will be used in the geographical sense and will be utilized to describe the group of people living on the case study island, Fuvahmulah. It is an objective of the research to provide detailed differentiations regarding the opinions, interests, and motivations of the individuals and subgroups within the community. When discussing collective action stemming from within the community, it will be referred to as the emergence of a community field in line with Paveglio et al. (2017).

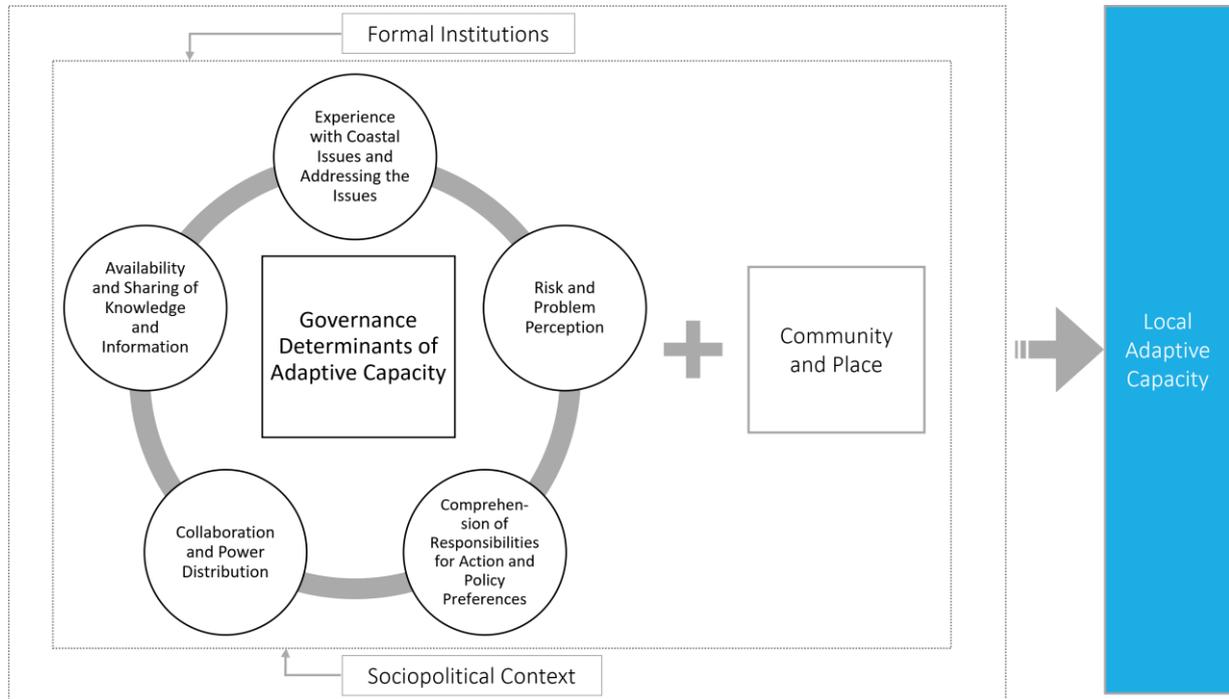
### **2.3 Analytical Framework**

The following part provides the analytical framework utilized to understand the local adaptive capacity on Fuvahmulah by combining features of the various concepts introduced above.

Coastal problems are a growing concern for the people of Fuvahmulah as for many other populations of small islands in the face of climate change. The need for local adaptive action is widely acknowledged as a necessity in numerous cases. Adaptation at the local level is more effective when performed by the collective than by the individuals, which is why the community is designated as the analysis unit. Coastal adaptation measures are implemented locally, yet numerous state actors, organizations, and private actors on all levels influence the activities on the local level and are also required to be involved in order to achieve the collective objective of protecting the coast. Governance structures encompass the interactions regarding social, biophysical, and economic systems that enable local adaptive actions and enable or hinder the integration of the local people in this process (*Spires et al. 2014, Engle and Lemos 2010*). By understanding and assessing the governance variables that influence the adaptive capacity, the multiple influences on the levels are identified, and aspects that enable or hinder the local level to build adaptive governance can be identified. Adaptation activities are often influenced by the contested nature of decision-making processes and factors such as authority and politics (*Adger et al. 2012, O'Brien 2012, Mollinga 2008*). It needs to be understood who is included in the decision-making process and whose voices are taken into consideration or not as well as who wins and who loses by the decisions. Therefore, it is necessary to comprehend the location of influence and power in the institutional arena (*O'Brien 2012*). The utilized adaptive capacity framework takes advantage of the resilience perspective that allows an analysis of the reciprocal linkages between the actions on multiple levels. At the same time, the vulnerability framework provides a lens that highlights the political and power conditions that shape adaptive capacity. Furthermore, communities are not a homogenous group with one aim; numerous interests, perceptions, and values are embedded within a community that needs to be understood in order to be able to assess if there is the potential of the community to be further integrated into the adaptation measures in the future (*Paveglio et al. 2009*). *Fulu (2007, 860)* has stressed the need to consider the heterogeneity of Maldivian communities, as they are “cross-cut by social differences; contested and fragmented.” Based on these considerations, two aspects on the local level are further investigated to understand the local adaptive capacity in a more comprehensive fashion: the interactions and relationships within the community and the relationship to the physical space they inhabit. Additionally, both aspects of analysis are shaped by a broader political context, which is analyzed in this work. Based on these considerations and in order to better understand the potential of the capacity to adapt on the local level, a framework that investigates local adaptive capacity from two perspectives is proposed: One perspective focuses on the interlinkages and interdependencies of the governance structures on the multiple levels and the other on

## Conceptual Framework: Local Adaptive Capacity

an in-depth analysis of the local level with a focus on the community's structure, relationships, and the place attachment. In order to achieve this, the adaptive capacity is assessed based on variables that have been derived from literature presented in part 2.1.4 that have been shown to influence the adaptive capacity (Fig. 5).



**Fig. 5: Analytical framework to assess local adaptive capacity (own illustration)**

The investigation makes use of the fundamental principles of the two frameworks, the vulnerability and the resilience framework, and furthermore integrates the investigation of power relations. Furthermore, due to the importance of the community in this regard, the social context on the local level is explored in detail. Both fields of interest are scrutinized from a critical perspective, which puts the significant aspects of the political context presented in chapter 2 at the forefront of the analysis. By understanding the adaptive capacity on the local level from a multi-level governance perspective and by pinpointing the contextual factors, a better comprehension of how coastal issues can be better dealt with is achieved.

### 2.4 Research Aim and Guiding Research Question

Adaptive capacity is identified as an important factor that can improve the prospects of sustainable outcomes for populations in the face of environmental changes. This research seeks to understand how local adaptive capacity is influenced by analyzing the multi-level governance structure that shapes it as well as influential community factors that enable or hinder action on the local level within a broader sociopolitical context. Based on the conceptual considerations presented, the main guiding research question for the thesis is:

**How is local adaptive capacity enabled or hindered by influences from multi-level governance and the local context within a broader political context?**

As presented in the analytical framework, the question needs to be answered in two steps. Firstly, the multi-level governance determinants on adaptive capacity must be scrutinized. The governance system distributed over various levels enables or hinders action by certain actors. The aim of this step is to understand how far the governance system enables or hinders the adaptation at the local level. In particular, this section identifies and investigates the influence of the formal and informal institutions as well as scrutinizes the distribution of responsibilities among the levels. Secondly, with a focus on the local level, there is a need to understand how far the local community wants to get involved and what factors shape the feeling of wanting to get involved, which is highly influenced by place attachment that can either lead to collective action or suppress it. This section aims at understanding how likely community action is on the local level. Therefore, it is of particular interest to characterize the relationships between community members and analyze how this influences community action. Furthermore, this part scrutinizes the relationship of the people with the island and its environment and investigates how this influences the capacity to adapt. Also, as pointed out, for both fields of interest, the broader sociopolitical context is highlighted in the analysis to understand how adaptive capacity is affected by these contextual factors (Fig. 5).

### 3 Research Approach

The thesis' objective is to understand the wide range of factors that influence adaptive capacity on the local level in the context of coastal governance. A central aim is to scrutinize how the local-level actors and the affected community have been influenced by the governance system as well as the broader sociopolitical context. Based on these contemplations, an important goal of this thesis is to include the heterogeneous opinions, perceptions, values, and interests of the organizations and groups on the local level, which has often lacked in governance analyses. Nevertheless, as shown in chapter 2, the opinions and interests on the local level are shaped, and the decisions in favor or against measures that are implemented on the local level are influenced by or even made by actors on other levels, especially on the national level.

As this field has been largely under-investigated, an exploratory research strategy was utilized as it allows to generate new knowledge and insights as well as to develop a theory with a focus on real-life contexts and contemporary phenomena (*Füssel and Klein 2006*). In more detail, a mixed-method methodology that connects qualitative with quantitative approaches of social research – with a strong focus on the former – was applied. Qualitative research is particularly appropriate for exploratory studies and is seen as introductory research to a field of interest (*Flick 2019*). The main purpose of it can be seen in the gathering of opinions, motivations, and reasons. It should be used when the topics and objects are complex, unclear and when, in the eyes of the researcher, there are contradicting opinions on the topic. One approach to qualitative research is a case study methodology. Case study methodologies enable a deeper analysis of a phenomenon and are capable of providing a deeper understanding of the research interest (*Yin 2018*). A case study approach equals scrutinizing a phenomenon in its context, understanding the causations, and also identifying underlying principles (*Sovacool and Linnér 2016*). Therefore, it is a fitting approach to investigate adaptive capacity, as it allows to examine the understandings, perceptions, and adjustments, which are influenced by contextual factors (*Thayyib 2019, Yin 2018*). While case studies are able to produce in-depth knowledge that are full of detail, they are also seen to be difficult to analyze due to the rich detail and the difficulty of summarizing the data (*Glaser and Strauss 2017*). In order to obtain data for the case study analysis, multiple methods were utilized. The variety of applied social science methods allows understanding the local adaptive capacity in its entirety. By combining population surveys, semi-structured interviews, as well as a literature, document, and media analysis, and observations, it was possible to obtain an in-depth insight of the attitudes and opinions of the actors on

## Research Approach

the one hand, and of the governance structure, its context as well as its effects on adaptive capacity on the other hand (*Whitney et al. 2017*).

All research methods, excluding the literature, document, and media analysis, were applied during two field stays on the Maldives. The literature, document, and media analysis was a process that spanned the whole research process, and the gained insights gained were continuously integrated into the research. Both field stays supplemented each other. The aim of the first field stay of six weeks in March and April of 2017 was to gain an insight into how people on a peripheral Maldivian island cope with coastal issues and how addressing coastal issues is dealt with in the country from a multi-level governance perspective. On the basis of the data that was gathered in the first field trip, the research focus shifted towards exploring the contextual factors that enable or hinder local adaptive capacity in the second field stay of seven weeks in January and February of 2019. Contextual factors that have affected how the community is being involved or how the community cohesion has been affected by the changing political atmosphere in the country were put into the spotlight of the investigation.

One facet of the research aimed to highlight the linkages between a peripherally located inhabited island, Fuvahmulah, with the political and administrative center of the country, the capital Male'. This was reflected in the research locations. While the majority of the time of the field trips took place in Fuvahmulah, the capital of the country, was also visited twice during each of the trips to conduct interviews with government officials and other actors on the national level. Furthermore, the stays in Male' allowed observations on the coastal protection strategy in the capital region of the country, which differs strongly from that on peripheral islands (cf. chapter 5).

In the following, the applied methods of qualitative social research and the way they were utilized are delineated.

### **3.1 Literature, Document, and Media Analysis**

The literature, document, and media analysis included the analysis of relevant books, laws, regulations, working papers, as well as websites and newspapers. The analysis led to insights regarding the political and societal history as well as the contemporary situation on the Maldives. Additionally, by investigating laws and regulations, the understanding of the formal institutions of coastal governance was improved.

In general, only a limited number of books on the history and society of the Maldives exist. To get a foundational comprehension, historical works were taken into consideration, such as *The*

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*Maldives Islands: Monograph on the History, Archaeology and Epigraphy* by H. C. P. Bell, which is based on his observations between 1890 and 1912. Furthermore, more recent works (e.g., Romero Frias 2012, 1999) were considered, in which especially Maloney's description of Maldivian society in *People of the Maldives Islands* was fruitful. Further contemporary accounts on social issues were taken into consideration (e.g., Borri 2017). With regard to the understanding of recent political developments, the book *The Maldives. Islamic Republic, Tropical Autocracy* by Robinson (2015) must be highlighted for its detailed investigation. Furthermore, local researchers have written insightful analyses of Maldivian culture in English (e.g., Mohamed 2012). This overview of the historical development of the country was supplemented by a visit to the National Museum in Male', which offered an impression of historical artifacts.

The analysis of laws, regulations, working papers, as well as environmental impact assessment reports, helped to understand the formal institutional framework of the past and current environmental, coastal, and climate change adaptation governance. The documents were made available on online databases of the Maldivian ministries. The importance of the documents for the coastal governance system is discussed in chapter 5.2.1.

With regard to questions on environmental governance, websites from local non-governmental organizations (NGOs), such as the website of Bluepeace, offered important insights into environmental problems as well as background information and provided critical voices to political decisions and developments. Additionally, it was highly insightful to investigate the activities of the NGOs on the various social media platforms (e.g., Twitter, Instagram, Facebook). Maldivians, in general, are highly active on social media. While many posts are written in Dhivehi, the local language, a large number of posts and discussions on social media are in English and give an interesting insight on the contemporary environmental issues of the country and what problems are of interest to the people.

Current affairs, political developments as well as environmental issues were best understood through the analysis of online newspaper articles. To keep up to date, a Google Alert was set up that automatically sends notifications when an article concerning the Maldives was published on the websites of various newspapers. While many alerts from international news webpages were stories about the opening of a new luxury resort, relevant articles from websites of renowned international newspapers such as *The New York Times*, *The Guardian*, or *Der Spiegel* were included. These were especially frequent during the heydays of the political quarrels in 2018. With regard to local newspapers, the websites of the few Maldivian newspapers that publish in English on a bi-weekly basis were scanned. Important newspapers included *The*

*Maldives Independent* (formerly *Minivan News*; which have suspended their activities in early 2020) and *The Edition*. However, an issue with these newspapers was that they are seen to be highly biased and are perceived to have close relationships with one of the political camps.

Another important source was the database of the National Bureau of Statistics (NBS) that provides statistics of the Maldives, including population, economic and weather data.

All in all, publications on coastal governance in specific, but also on environmental governance in the Maldives were scarce. This was the first indicator that the topic was fairly new and shaped strongly by informal institutions. In consequence, it was shown to be a necessity to collect empirical data and get into contact with relevant actors. Nevertheless, the analysis of documents, laws, and media publications supported the design of the questionnaires and interview guides.

### **3.2 Population Survey**

A central method of the study was two population surveys that were conducted during the field stays on Fuvahmulah. The surveys aimed for an in-depth insight into the heterogeneity of the community by obtaining individual opinions and attitudes of the islanders of all demographics. As the author is unable to speak Dhivehi, a local researcher assisted with the surveying to allow interviews in English and Dhivehi. The assistant was recruited with the support of a local scientist that endorsed the research. The local assistant was a high school graduate from Fuvahmulah who was fluent in English and was not affiliated with any political party. The assistant was trained in the techniques of proper scientific conduction of surveys. Furthermore, the questionnaire was discussed and translated into Dhivehi with the assistant and a senior Maldivian researcher in order to be able to clarify any language or conceptual issues and inconsistencies to guarantee a high level of data quality.

With regard to data collection, face-to-face interviews at peoples' houses were found to be most suitable for the research's objective. In consultation with local researchers and contact persons, it was seen to be most gainful to reach people in their houses due to limited possibilities to interview people in public areas as people mostly used their scooters to get around the island, and there are only a few areas where people socialize in public areas. In both surveys, a strategic sampling strategy was implemented. As the main focus of the survey was on obtaining in-depth qualitative data, which time-consuming face-to-face interviews allow, the achievable sample size was limited by time and resource constraints (*Groves et al. 2011*). Therefore, on the basis of pre-tests and the derived estimated duration of an interview as well as the available time, a

## Research Approach

specific number of targeted interviews was determined for the two surveys. On the basis of that target number, it was decided that in the first survey, one member of every eighth household and in the second one, a member of every ninth household would be interviewed in all wards of the islands. The first household for each survey was chosen at random. Furthermore, a plan of the surveying sequence of the island's streets was designed in order to allow systematic sampling. Further specifications were that per household, one member would be interviewed and that only persons above the age of 14 were considered. If no one was available at a selected household, the nearest neighboring house was chosen. The interviews were conducted either on the porches of the houses or in the living rooms (Fig. 6). Thus, the interviews took place in a location where the respondents felt comfortable, which enabled a good atmosphere for the talks (*Bernard 2017*). The surveys were conducted with two researchers, the assistant, and the author, and with one interviewee.<sup>2</sup> In a few cases, the interviews were interrupted briefly or for longer times by household members; however, it was attempted to conduct the interviewee with only one respondent and to limit the interruptions.<sup>3</sup> Furthermore, notes were taken regarding the situation of the talk or any particular occurrences after each interview. In case the interview was conducted in Dhivehi, the research assistant used a translated version of the questionnaire and directly translated the interview into English to allow inquiries.

For both surveys, pre-tests were conducted with a small sample of respondents in Male', in Hulhumale as well as in Fuvahmulah to reduce any unclarities, to improve the wording as well as the survey design. Furthermore, the survey design was discussed with senior researchers from German universities as well as with Maldivian researchers.

As the objectives of the two field surveys differed, the design of the surveys, including the questionnaires and analysis, were also different. The specificities of the surveys are delineated in the following.

### **First Phase**

The questionnaire of the first survey aimed to get a general comprehension of the community members' attitudes towards the environment in general, as well as towards the coastal environment and risk perception in particular. It was also of interest in how far the community has been involved in development projects, the community's degree of satisfaction with this situation, and their expectations for the future. Furthermore, their knowledge of and preferences of coastal

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<sup>2</sup> Nine interviews from the first phase were conducted by two senior scientists that were members of the research project.

<sup>3</sup> These interruptions were noted down and carefully analyzed with regard to possible influences of the interruptions on the interview data.

## Research Approach

protection measures were a matter of interest. In order to achieve this, the questionnaire included four guiding themes (excluding biographic information on the participant): (1) Perceptions of the environment and the coast; (2) Perceptions of environmental problems including climate change impacts; (3) Perspectives on community life and the relationship between the people and politics; and lastly, (4) Perspectives and attitudes towards coastal protection measures.

The semi-structured questionnaire included a total of 22 questions with a mix of open-ended and closed-ended ones (excluding the biographic questions). The closed-ended questions were chosen for inquiries about issues where it was possible to provide pre-established criteria on the basis of other research, e.g., questions regarding which societal problems of society the interviewees assessed as the most problematic. The open questions allowed first insights into questions where no or limited information was available. These allowed the gathering of opinions and attitudes with regard to a topic that has not been investigated in-depth in this part of the world. Furthermore, due to the semi-structured approach, follow-up questions and the clarification of aspects were possible.

A total of 116 people between the age of 14 and 86 were interviewed. All age groups of the population were represented in the sample. 21 percent of the interviewees were between the age of 14 and 24, 25 percent between the age of 25 and 34, and 26 percent between 35 and 44 years old. Furthermore, ten percent were between the age of 45 and 54 and between 55 and 64. The age groups of 65 to 74, 75 to 84, and above 84 were represented by six percent, one percent,



**Fig. 6: During an interview (own photo, 2019)**

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and one percent, respectively. The gender ratio was 53 percent female to 47 percent male.<sup>4</sup> The interviews lasted between 25 and 90 minutes and were done via paper-and-pencil interviewing (PAPI). The large discrepancies of the duration can be explained by the differing interest in the topic by the respondents and the age differences, as especially younger people were shown to give brief answers.

The data was then entered into Excel, where it was analyzed. The answers to closed questions were analyzed through methods of descriptive statistics. The open-ended questions were categorized and coded, which allowed the possibility to quantify the results as well (*Reuber and Pfaffenbach 2005*). In instances, correlations were calculated to identify patterns in the responses.

### Second Phase

The second survey emphasized the current and potential future role of the local level in coastal governance and the influence of contextual factors. In more detail, the survey attempted to understand the social cohesion on Fuvahmulah, to get a better picture of community activities in general and especially in addressing coastal issues, and to investigate how the community members assess the role and influence of politics on the topic. The questionnaire encompassed 20 open-ended questions that covered five themes (excluding the biographic questions): (1) Perceptions on community life; (2) Engagement potential; (3) Climate change experience; (4) Engagement and coastal protection; (5) Politics and adaptation. The exclusive usage of open-ended questions allowed a better grasp of the topic that has been under-investigated, as the questions provide a large degree of leeway for the interviewees in their responses.

In total, 98 people were interviewed between the age of 17 and 93. Again, all age groups of the population were represented in the sample. 11 percent of the interviewees were between the age of 15 and 24, 28 percent between the age of 25 and 34, and 18 percent between 35 and 44 years of age. Between the age of 45 and 54 were 15 percent, the same percentage as the group between 55 and 64 years of age. Eight percent were between the ages 65 and 74, three percent between 75 and 84, and one percent was older than 84 years. With regard to the sex of the interviewees,

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<sup>4</sup> Comparing the sample with the Census of 2014 revealed that the sample comes close to the age distribution on Fuvahmulah. When only looking at the population of above 15-year-old inhabitants on Fuvahmulah, the distribution is as followed (sample/census): 15–24: 19 percent/ 25 percent; 25–34: 25 percent/ 24 percent; 35–44: 26 percent/ 17 percent; 45–54: 10 percent/ 14 percent; 55–64: 10 percent/ 9 percent; 65–74: 6 percent/ 6 percent; 75–84: 1 percent/ 4 percent; above 84: 1 percent/ 1 percent. The same holds true for the sex ratio of the sample. While the ratio of the sample was 53 percent female and 47 percent male, the census showed a ratio of 55 percent female and 45 percent male.

55 percent of the interviewees were female, while 45 percent were male.<sup>5</sup> The interviews lasted between 30 and 90 minutes. The semi-structured survey approach allowed a degree of flexibility to the sequence of the questions. Each interviewee was asked if they agreed to be audio recorded. Numerous respondents were dismissive of being recorded, as they were unfamiliar with surveys and especially with being interviewed by a foreigner. In that case, the answers were noted via the PAPI technique. Those that were audio-recorded were later transcribed. The software MaxQDA was used to structure, code, and analyze the survey data. A content analysis, a systematic process of investigation that follows a number of steps, was applied to code and dissect the data. As this method was also applied for the analysis of the semi-structured interviews, it is delineated in the following section.

### 3.3 Semi-structured Interviews

Semi-structured interviews were applied in both field trips and represented the second main research method. Interviews with actors of the coastal and environmental governance system in the Maldives allowed exploring the relevant procedures, views and opinions, and knowledge systems. The interviews incorporated a mixture of features attributed to expert interviews and ethnographic interviews (*Kaiser* 2014). Firstly, the interviews aimed to uncover expert knowledge regarding coastal governance – which is the defining feature of expert interviews (*Kruse* 2015). More specifically, explorative expert interviews were identified to be a suitable method for the research objective as it utilizes a flexibly structured interview guide which provides leeway to the respondents to structure the talks and stress the aspects they see as important (*Bogner and Menz* 2002). Experts, as discussed here, are professionals, political actors, and researchers that have gained experience in the fields relevant for this study, e.g., coastal protection, climate change adaptation, and community participation in the Maldives. Expert interviews are more a technical discussion than an interview (*Kruse* 2015). It is, therefore, a useful means for gaining intelligence on the coastal governance structures. The experience and the knowledge of the informant are hereby necessary to understand background information and developments in this field. In these interviews, the informant is not the focus of the research, but the information he has as well as his embeddedness in the governance system. As there

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<sup>5</sup> Comparing the sample of the second survey with the Census of 2014 revealed that the sample is similar to the age distribution on Fuvahmulah. When only considering the population of above 15-year-old inhabitants on Fuvahmulah, the distribution is as followed (sample/census): 15–24: 11 percent/ 25 percent; 25–34: 28 percent/ 24 percent; 35–44: 18 percent/ 17 percent; 45–54: 15 percent/ 14 percent; 55–64: 15 percent/ 9 percent; 65–74: 8 percent/ 6 percent; 75–84: 3 percent/ 4 percent; above 84: 1 percent/ 1 percent. The same applies to the sex ratio of the sample. While the ratio of the sample was 55 percent female and 45 percent male, the census showed a ratio of 55 percent female and 45 percent male.

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remains limited accessible information on the topic, the gaining of information from within the governance system has shown to be vital for a deepening of the understanding. This is of particular interest, as coastal governance is shaped next to the formal institutions by informal ones that are somewhat concealed and can be difficult to identify. The help of insiders thereby supports the research to identify and allow a more in-depth analysis. Secondly, the interviews also aimed to get a better grasp of the interviewees' opinions on the approach to coastal and environmental governance with a special focus on the integration of the local level actors and the community and the influence of the sociopolitical context. As all experts are part of the societal system and influenced by personal experiences and information reception, it was believed to be highly unlikely that a person from within the country is able to evaluate the situation objectively. Thus, it was important to pay particular attention to the subjectivity of these interview parts. The objective of obtaining opinions is a trait of ethnographic interviews and not of expert interviews (*Kaiser* 2014). Regarding the expert interviews, a purposive sampling technique was applied. This technique allows the selection of interview partners that have relevant knowledge and which therefore enable the researcher to answer the research questions (*Palinkas et al.* 2015). The interview partners were chosen with regard to their role, experience, as well as their influence in the decision-making process in coastal governance or related fields. As the Maldives is a new democracy and freedom of speech remains something new for the country, an agreement was made with all interviewees to not be identifiable in the research outcomes. The first contact with the interview partners was either made through a research partner from the Maldives or scoped through internet research and then personally contacted via email or through social media channels before the field trip. Through recommendations of the initial interview partners, further relevant interview partners were identified and contacted. A semi-structured interview is led by an interview guide that addresses the issues of concern (*Kruse* 2015). The interview guide orders the core questions of the interview in a systematic way and provides formulation suggestions for the questions that can be adapted to the interview situation (*Creswell and Poth* 2018). Additionally, the interview guide helps to utilize the results of the interviews in respect to the guiding questions of the research and allows comparability of the responses of other interviews (*Mayring* 2016). The structures of the interview guides are delineated for each field stay in the next section.

All interview partners were asked if the recording of the interview was agreed to. However, due to the sensitive topic and the political situation, not all interview partners approved. In these cases, interview notes were taken during the talk. The transcriptions of recordings focused only on the content and did not pay attention to the linguistic aspects as it was not of interest to the

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analysis (*Kuckartz 2018*). On top of this, after each interview, an interview protocol was made that included notes on the situation of the talk, any special occurrences, the impression of the interviewee, as well as any other ideas and thoughts. Most interviews were conducted in English. Only the two interviews with the island chiefs on Fuvahmulah had to be translated from the research assistant (more information in the next section).

The collected data of the interviews were structured and analyzed via the MAXQDA software and collated into a structuring content analysis, a type of qualitative content analysis was conducted. *Mayring (2015)* states that the qualitative content analysis puts the object in the foreground, which allows understanding the relevant institutions that shape coastal governance in the Maldives. A structuring content analysis is particularly suitable to the spectrum of topics contained in the interview guide because statements of the interviewees can be correlated with the predetermined categories of interest (*Mayring 2015*). In order to conduct such a structuring content analysis, a number of steps are preordained (Fig. 7). In the first step, the systemization and structuring of data are performed through the process of coding. Data about particular content areas, which are based on the research questions, were systematically extracted from the material and assigned with category codes. The next step encompassed the review of the material on the basis of the categories. In the following, the coded sections were further classified, and subcodes were assigned that showed the manifestations of the answers within the codes in an inductive approach. As a result, an extensive code system was established. Then, the interviewees' responses were extracted on the basis of the code system and were analyzed and compared to one another. The extracted material was then paraphrased and summarized, which finally allowed the analysis of the material in accordance with the main themes and subthemes. Each of the steps is furthermore supplemented by comprehensive memo taking that supports the thought process and enables deeper understanding. These steps provide insights on the various standpoints and arguments, opinions, and interests of the actors and allow to understand where large differences and similarities in the opinions are located, for example, through cross tables (*Kuckartz 2018*). Additionally, it was scrutinized how far the interviewee's personal background and expertise, as well as his position in an organization, influenced the responses.

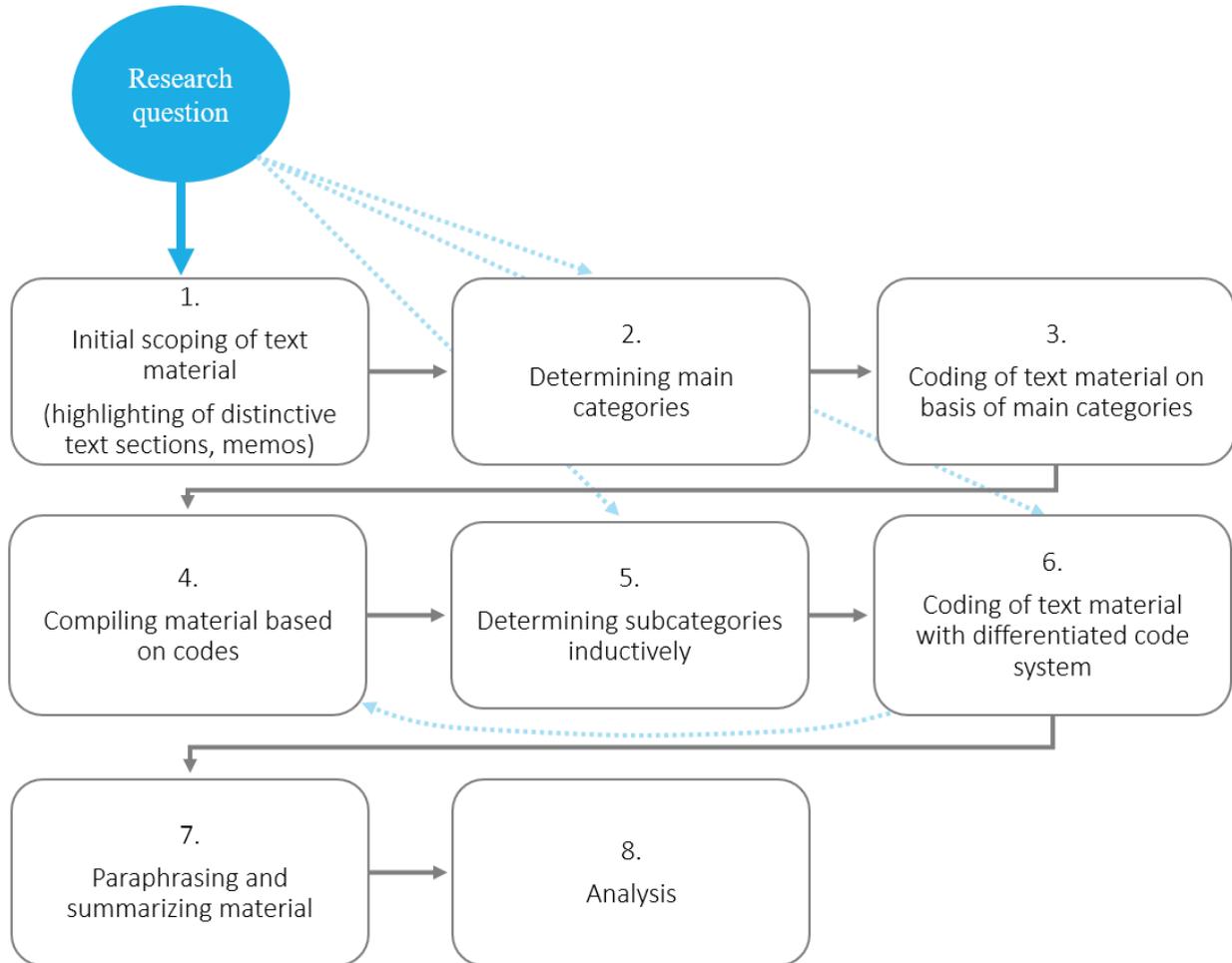


Fig. 7: Process description of a content structuring (own illustration, after Kuckartz 2018, 100)

### Data Collection

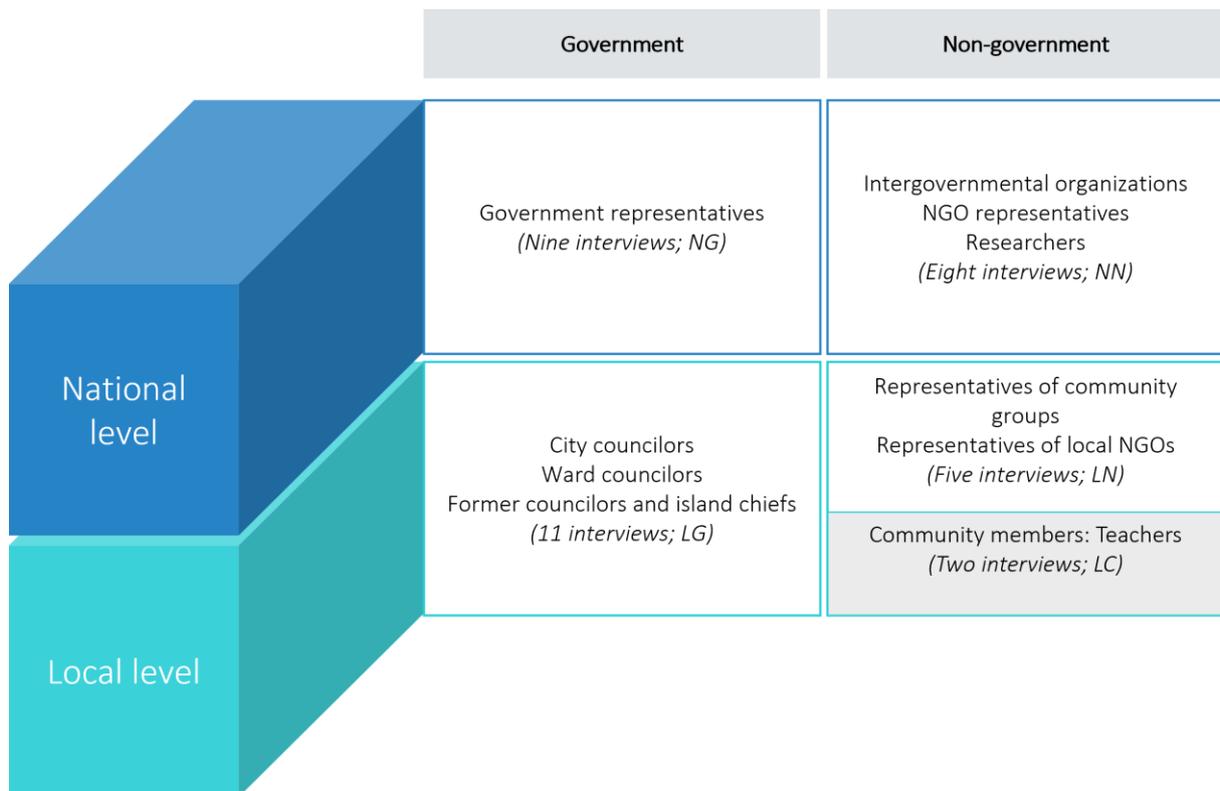
All in all, 35 interviews were conducted with actors on the national and the local level. At the national level, all interview partners had expertise that was relevant to coastal governance or climate change adaptation (Fig. 8). Interviews with actors at the national level encompassed representatives of several departments of the Ministry of Environment and Energy (MEE),<sup>6</sup> members of intergovernmental organizations and NGOs, as well as local researchers. At the local level, interviews were conducted with current and former civil servants, officers of environmental projects, representatives of NGOs, as well as with two teachers. These individuals either had knowledge on how the local level is integrated into the tasks or have gained some knowledge with regard to coastal governance. The data that was obtained through the semi-

<sup>6</sup> With the aim of increasing the readability of the thesis, all ministries will be referenced by their title as of June 2018. This is relevant with regard to the restructuring of ministries after the 2018 presidential election. Because most data were collected before and only shortly after the new government was sworn in in November 2018 and numerous ministries were renamed, the data referred to in this thesis is therefore most accurate for the period before that time. Nevertheless, according to a government representative, the restructuring does not affect work within the relevant departments of the ministries (NG07).

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structured interviews were cross-checked with the information that was acquired from the document analysis and with persons in a position of trust to minimize personally biased opinions or misleading information. While most interviews took place in a one-on-one situation, numerous interviews were also conducted with two or more active interviewers or a number of interviewees (Annex I).

Due to the varying foci of the field trips, the design and matters of interest of the semi-structured interviews differed. In the following, the topics of the two field trips are discussed. All interview guides commenced with questions regarding the role and organization of the interview partner.



**Fig. 8: Overview of the interview partners. The number of interviews for each group and code is given in the parentheses (Codes will be used to refer to interview partners in text and are consecutively numbered (e.g., NG01,...) (own illustration)**

### Focus of the First Field Trip

The first interview guide included four main themes. It aimed to get a better understanding of how the environment in general and the coastal areas, in particular, are assessed as well as what factors (e.g., cultural or religious aspects) influence this, and how sea-level rise and associated coastal problems are assessed as an environmental issue. Another focal aspect was to understand how coastal issues are dealt with, with a particular focus on understanding what actors and groups participate in the decision-making processes of coastal governance and climate change adaptation in the Maldives. Furthermore, it was of special interest to understand how

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far there is community involvement in environmental protection activities. Based on these interests, the questionnaire encompassed eight themes: (1) Assessment of coastal problems; (2) Maldivians and the environment; (3) Community engagement; (4) Center-Periphery Relationship; (5) Coastal adaptation measures; (6) Decision-making processes; (7) Politics and climate change; (8) Education and public awareness.

### **Focus of the Second Field Trip**

The second field trip's interview guide focused on questions regarding the involvement of local-level actors and the affected community in the coastal governance system. This incorporated an interest in the influence of contextual factors, such as the political and societal conditions and developments. In particular, it was aimed to understand how the various political approaches in the past have influenced the integration of lower-level actors. The questionnaire included four main threads: (1) Community life; (2) Community engagement; (3) Politics and engagement; (4) Coastal governance. A second focus was put on the activities of NGOs that conduct environmental protection activities. Therefore, three interviews were conducted with representatives of NGOs. The interviews were based on a special interview guide, which included the topics: (1) Information on NGO; (2) Personal motivation; (3) Community engagement; (4) Cooperation with the government.

Furthermore, to allow better insights into the historical developments on Fuvahmulah, two discussions with former council members were conducted. The interviews provided a deeper insight into social cohesion and the developments of the community on the island and particularly how changes have manifested themselves over the last decades. The interviews were conducted in the living rooms of the island elders and were based on a special, shorter interview guide that focused on the themes: (1) Community life on Fuvahmulah; (2) Decision-making process.

Another component of the second field trip was the chance to conduct interviews with relevant actors on Fuvahmulah's neighboring atoll, Addu Atoll. This was a possibility to obtain insights from interviews with local-level actors on another peripherally located island that allowed a comparison to the obtained information on Fuvahmulah. Three interviews with ward and city councils were conducted, as well as with an environmental NGO representative and an employee of an environmental project.

### 3.4 Field Observations and Notes

Field observations complemented the before-mentioned methods in order to get a complete picture of how coastal issues are dealt with in the Maldives. *Adler and Adler (1994)* have argued that field observations are fundamental for all research methods in social sciences. Observations, which were conducted mostly in non-participant or partially-participant approaches, allowed to get a better grasp of the living situation on Fuvahmulah, how the life of the islanders and community life is organized, and the relationship of the people to the coastal zone (*Ciesielska et al. 2018*). Living on Fuvahmulah for more than a month at a time allowed the author to get a better grasp of the relationships, interactions, and hierarchies within the community. It was a central aim to be able to represent the whole community through data, including people of different genders and ages (*Atkinson and Hammersley 2007*). The observations were mostly conducted on the main streets of Fuvahmulah, in coastal areas, or at festivities.

The observations were noted in a digital field notebook. Fieldnotes are seen to be important to provide a rich context for the analysis and thereby enhance and complement the other collected data (*Creswell and Poth 2018*). While it was aimed to make notes as objective as possible, it is very important to acknowledge that notes are invariably selective and are influenced by the interpretation of the note-taker (*Emerson et al. 2007*). Next to the notes of the observations, experiences, thoughts, ideas, and other contextual information was written down in a field notebook that was updated daily. The field notebook was furthermore important for self-reflection, identifying bias, and learning throughout the research process (*Mulhall 2003*). Additionally, photographs were integrated into the field notebook, which functioned as visual support for the documentation.

## 4 Study Setting – The Island(s), the State, and the People

In this chapter, an overview of the ecological, political, and social-economic setting is presented. The chapter gives an overview of the coastal environment, describes the evolution of the political system with a focus on decentralization efforts, and provides an insight into the factors that have shaped social cohesion in the Maldives. The scrutiny of the components is necessary for assessing local adaptive capacity in the following part. In more detail, the chapter delves into the following aspects: (1) An overview of the geography; (2) The coastal environment with a special focus on coastal vulnerabilities and their causes, as well as the coastal elements of coral islands that provide protection services; (3) Historical and current developments in the political system of the Maldives as well as in the context of environmental governance that have shaped the degree of involvement of actors and the community on the local level in questions of development; and lastly, (4) General socioeconomic factors that influence social cohesion, which is an important element for local adaptive capacity. With respect to the research objective, the chapter provides an overview of the situation on the country and the local level.

### 4.1 Overview: The Maldives

The Maldives is located in the southwest of India in the Indian Ocean. The 1 200 coralline islands of the country, of which 190 are inhabited, are grouped in a double chain of 26 atolls and extend over an area of approximately 100 km from west to east and 860 km from north to south (*Wadey et al. 2017, Ministry of Tourism 2015*) (Fig. 9). The three southernmost atolls are located south of the equator. Next to the 190 inhabited or *local islands*, further 105 islands are designated as tourist resorts, and about 14 are used only for industrial purposes (*Ministry of Tourism, Arts & Culture 2013*).

The registered Maldivian population of 383 135 in 2019 was widely dispersed (*NBS 2020b, Table 3.3*). While more than a third of the country's population, around 133 412 persons, resided in Male', only one other island had a resident population larger than 10 000 according to the Census of 2014 (*NBS 2020b, Table 3.4*). Three islands have between 5 000 and 9 999 inhabitants, and 16 have between 2 000 and 4 999 inhabitants. A quarter of all inhabited islands have between 1 000 and 1 999 inhabitants (*NBS 2020b, Table 3.4*). Based on projections, the centralization of the population will increase in upcoming decades, with the population in Male' almost tripling to 356 243 and the population in the atolls decreasing until 2054 (*NBS 2018*). The population of the Maldives is young, with a median age of 28.9 years. The majority of the population was under the age of 30 in the year 2014 (59 percent) (*NBS 2020b, Table 3.2*).

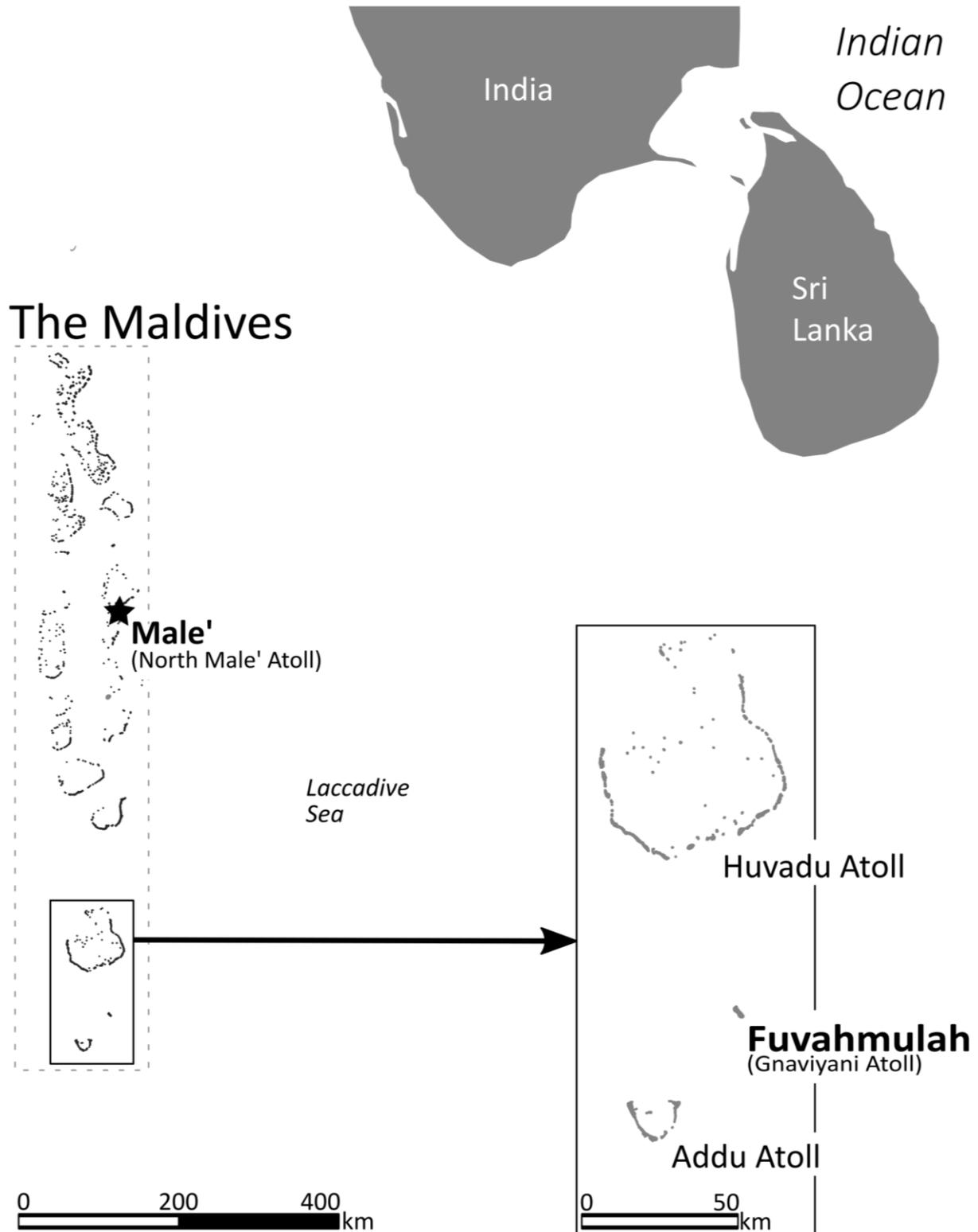


Fig. 9: The location of the Maldives and Fuvahmulah in South Asia (own illustration)

Since 2013, the Maldives have been classified as a high middle-income country by the World Bank with a gross national income per capita of USD 5 598 in 2019 (*World Bank 2020*). The economy is dominated by three sectors in the country: tourism, fishery, and the service sector. Tourism has expanded to be the largest economic sector of the country and has made the country dependent on the revenue of the tourism sector (*Ministry of Tourism 2015*). The number of

tourist arrivals has steadily increased: In 2013, the Maldives registered more than 1 million (1 125 204 million) arrivals for the first time. Since then, the number has increased to 1 484 274 million in 2018 (*NBS* 2019, Table 10.8). The most important tourism type are resorts, where one uninhabited island operates as one resort, known as the “one island one resort policy” (*Zubair et al.* 2011, 226). The first resort opened in 1972, and until 2009, these were the only places where tourists were officially allowed to stay. In 2009, regulations changed, and tourists were allowed to stay on local islands. Since then, hotels, guesthouses, and safari vessels have been added to the accommodation facilities and are allowed to operate on local islands (*Robinson* 2015). Resorts, however, remain the dominant form of accommodation facility, adding up to 71 percent of the tourist bed capacity (*NBS* 2019, Table 10.2). Surveys have shown that the strongest pull factors for visitors are the “beaches” and the “underwater beauty” of the country (*Ministry of Tourism* 2018, 28)

The climate of the country is a tropical monsoon climate in reference to the Köppen climate classification. Two monsoon seasons dominate the weather patterns of the Maldives. The effects of the monsoon climate in the north are greater than in the southern regions, which are more influenced by the equatorial currents. The northeast monsoon lasts from December to April and is characterized by dry air, calm winds, and low amounts of precipitation.<sup>7</sup> The southwest monsoon from May to September is characterized by higher precipitation and stronger winds that are transported from the Indian Ocean (*MEE* 2016, 17).<sup>7</sup>

#### **4.1.1 The Maldivian Islands and their Coasts**

In the first part of this section, an overview of the structure, the functions, and the conditions of the coastal environment of the Maldives is provided. The section commences with a brief outline of the formation process of atolls and coral islands due to its importance for comprehending why coral islands possess a degree of resilience to coastal stressors. Thereafter, an overview of the elements of coral islands that function as natural coastal protection is provided. Furthermore, reasons for the increasing coastal risks are presented. The second part of this section focuses on Fuvahmulah and demonstrates how the coastal issues have manifested themselves on the island, and provides an overview of the possible causes. Subsequently, an overview of the current and future vulnerabilities of the Maldives is given.

Only approximately 0.3 percent, approximately 298 km<sup>2</sup> of the 107 500 km<sup>2</sup> of the whole country is land area. The Maldives has 644 km of coastline, and 5 percent of the land area of the

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<sup>7</sup> The average monthly rainfall (1978–2015) in Male’ during the northeast monsoon amounts to 108 mm and during the southwest monsoon to 197 mm.

Maldives is made up of beaches, which consist of unconsolidated materials and are therefore of dynamic nature (*MEEW* 2007) (Fig. 10). *Bremner* (2017, 19–20) elegantly depicted the essence of the landmasses of the Maldives as follows:

“Coral islands are not islands in the ocean but islands of the ocean, produced by its dynamic energies. They are topological forms, liminal spaces, geology and biology, human and animal, land and sea. They are arrested matter in motion, driven by currents, tides, winds, seasons, and marine life. Islands, lagoons, mangrove swamps, sea grass beds and coral reef flats are little eddies of relative stability in a dynamic flow of relational instability. Landforms are sand-forms, relatively unstable, always moving, formed by erosion, deposition or siltation and shaped by the forces of seasonal monsoons.”

While the projected climate change sea-level rise and its impacts are anticipated to have negative effects on the archipelagic country, studies indicate that the Maldivian islands have a natural resilience that allows them to adapt to the changing stressors. The resilience has developed through the formation process of the Maldivian atoll system and of the islands. The formation processes also demonstrate how the country’s landmass was only formed as a result of rising and lowering sea levels and as well as through accretion and erosion processes. These processes are underlined by a saying that the Maldives is “the nation of appearance and disappearances” (*Vince* 2009, 37). The formation processes furthermore illustrate how the islands’ elements



**Fig. 10: Aerial view of Maldivian islands (own photo, 2017)**

have developed that establish the resilience to coastal stresses. Thus, a brief overview of the formation processes of the atoll structure and islands of the country is given hereafter.

### **Formation of the Atoll System**

The Maldives were formed on a volcanic ridge located between the Deccan Traps of India and the island of La Reunion (*Kench 2011*). In the Tertiary, aggradation and progradation phases, which were regulated by changes in the sea level, led to the accumulation of carbonate, which formed basement rocks (*Kench 2011, Belopolsky and Droxler 2003*). On top of these volcanic basement rocks, limestones are located with a thickness of 3 000 m. Multiple changes to the sea level and the aggradation of a carbonate bank led to an antecedent of the double atoll chain with an inner sea basin that is found today (*Kench 2011*). The shallow platform between the two chains was formed 15 to 10 million years ago in the mid-Miocene through lateral progradation from the outer margins of the atoll chains inwards. In the following period, the platforms were flooded, which moved the sediments backward in the direction of the periphery of the platforms. Following these processes, the platforms were karstified owing to the low sea level. In the Quaternary, the reefs developed mainly vertically through coral growth on top of the karstified elements, which again was a consequence of the fluctuations of the sea level during the Pliocene-Pleistocene, exposing and submerging the elements. The surface morphology of the Maldivian islands that is currently found is the result of the development of the growth of the coral reefs during the Holocene over the last 10 000 years. About 8 100 years ago, the Pleistocene surface was flooded by the sea, and the reefs grew rapidly in a vertical direction until 6 500 years ago when the growth slowed down (*Kench 2011*). The depths of the water in the atolls are generally between 25 and 50 m; the greatest depths are found in the center of the atoll. The depths are lower at the rim, as this is where the corals grow the most (*Betzler et al. 2013*). Between the two chains of atolls, the depths do not exceed 500 m in the so-called Inner Sea. The depths on the outer slopes of the Maldives are very steep and reach more than 2000 m (*Belopolsky and Droxler 2003*).

While the formation process of the Maldivian atoll system and the islands are linked, it is necessary to differentiate between the two processes to gain a clear picture (*Naylor 2015*). The following part, therefore, delineates the features of the Maldivian coral islands and the formation process.

### **The Islands of the Maldives: Characteristics and Formation**

Next to their morphological dynamic and the other characteristics described in the quote by *Bremner (2017)* given above, another specific feature of coral islands is their low elevation.

These characteristics can primarily be derived from the formation process of coralline islands. Coralline islands are products of biological processes. The islands of the Maldives generally originate from the mid-Holocene when the shallow lagoons, which formed during the formation process of the atoll system, were filled with the debris of the surrounding reefs (*Kench et al. 2005*). Most of the island-building occurred 5 500 to 4 000 years ago, and the islands have been mostly morphologically stable since then as they are located in a zone with generally little surface winds, known as the doldrums (*Kench 2011*). The more recent natural changes to the islands have been the growth of the outer reef of the islands, which has resulted in the forming of the moat around the shorelines of the islands that has a surface of planated coral-algal moat – a result of the fluctuating position of the beaches (*Kench et al. 2005, Kench 2011*).

The islands are composed of skeletal materials, gravel, and carbonate sand, which eroded the reefs and that accumulated over time through wave action (*Naylor 2015, Kench 2011*). Sediment that is produced through erosion of the reefs is either supplied to islands or contained in the reef system – both leading to the stability of the beaches and the islands. While in the long-term, the sediments are often cemented on the coast of the beaches, they remain highly dynamic and mobile in the short-term (*Ryan et al. 2019*). This is shown by the sediment transport in the reef systems of coral islands. Most prominently, these dynamics are manifested in the fluctuating position of the beaches on coral islands. The position of the beaches in the Maldives shift on a seasonal basis as a response to the influence of the monsoons (*Kench et al. 2006*), which is described in more detail in the context of Fuvahmulah in part 4.1.2.

All in all, the coral islands are shaped by a highly sensitive cycle of erosion and accretion processes and are highly dynamic, which leads to the stability of the landforms of the coral reefs. Accordingly, *Kench et al. (2005, 148)* argue that the Maldivian islands are “morphologically resilient rather than fragile systems, and are expected to persist under current scenarios of future climate change and sea-level rise.” In other words, it is argued that coral islands are naturally resilient to cope with environmental stressors and are able to adapt to changing environmental conditions to a degree (*Ryan et al. 2019*).

The next part explores the elements of the coastal ecosystems of coral islands that provide protection from the ocean forces and lead to the natural resilience of the islands and the stability discussed above.

### **The Coastal Elements of Maldivian Islands**

In general, three lines of natural coastal elements that provide coastal defense can be identified for the Maldivian islands: the coral reefs, the seagrass meadows between the reef and the beach as the second barrier, and the third one, the vegetation belt, locally termed as *heylihi* (*Bluepeace Blog* 2014). The importance of the coastal elements in respect of being able to cope with current and future stresses are shown in the following. However, climate change impacts and more immediate anthropogenic activities are interfering with the natural capacity of the islands' coastal features to cope with stress which is also be highlighted (Fig. 11).

#### *The Coral Reef*

The first line of defense is the reefs of coral islands that provide coastal protection services by dissipating large amounts of the incident wave energy and providing shoreline stability. It has been established that healthy reefs generally reduce up to 97 percent of the wave energy, which would otherwise affect the coastline (*Ferrario et al. 2014*). The coral reefs thereby protect the islands from flooding and storms (*Bridge et al. 2013, Ruiz de Alegria-Arzaburu et al. 2013*). There is growing demand to understand reefs as natural coastal protection infrastructure (*Elliff and Silva 2017*).

However, climate change impacts, as well as other human interferences, are negatively affecting the health of the reefs and are thereby reducing the protective function of coral reefs in the Maldives. Firstly, climate change impacts are likely to harm the reefs and thereby increase their vulnerability, as they are affected by ocean warming and acidification processes, sea-level rise, and the increase of tropical storms (*Perry and Morgan 2017*). For example, there have been a number of severe coral bleaching events in the past decades, with the most severe happening in 1998 and 2010, as well as in 2015–16 that resulted in a 60 percent decrease in coral cover in the central Indian Ocean (*Head et al. 2019*). There are, however, signs that corals might be able to adapt to being exposed to such changing conditions. Studies have shown that fewer corals have been bleached in the last event in the Maldives archipelago compared to similar conditions during a prior bleaching event, which indicates a potential adaptive capacity of the islands to the changing environmental conditions (*Cowburn et al. 2019, Pisapia et al. 2016*). Other studies have shown that the coral reefs are capable of adapting to the rising sea level as well by accreting vertically and thereby demonstrating natural adaptation (*Masselink et al. 2020*).

In regard to more immediate anthropogenic interferences, reefs have been negatively influenced by coastal modifications, such as the construction of infrastructure projects like harbors, boat channels, or coastal protection structures (*Kench 2012*). Other anthropogenic factors that put

stress on the reefs are pollution from human and solid waste. Waste dumping and polluted runoff can damage coral and impede the growth of coral reefs (*Lamb et al. 2018*). Sewage that is transferred into the ocean without being treated can lead to eutrophication and algal blooms, which act damaging towards coral reefs and limit their protective function as barriers (*Wear and Thurber 2015*). Damaged, unhealthy, and bleached corals lead to decreased coastal protection provided by the reefs, resulting in a higher likeliness of flooding events and increased coastal erosion rates (*Lamb et al. 2018*) (Fig. 11).

#### *Seagrass Meadows*

Located on the house reef, seagrass meadows function as a second line of defense. Seagrass meadows have a twofold function in protecting the coast. Firstly, they are able to attenuate wave transmission, which prevents erosion (*Lei and Nepf 2019*). Secondly, seagrass functions as a trap for fine sediments on the seabed, which leads to the prevention of algae growth, which is important for the health of the coral reef. However, seagrass is threatened by climate change impacts, such as the increasing temperatures and sea-level rise, as well as storms. Furthermore, anthropogenic threats are harming seagrass meadows, such as pollution, which leads to a decreasing protective function (*Ondiviela et al. 2014*) (Fig. 11).

#### *Coastal Vegetation (The heylhi)*

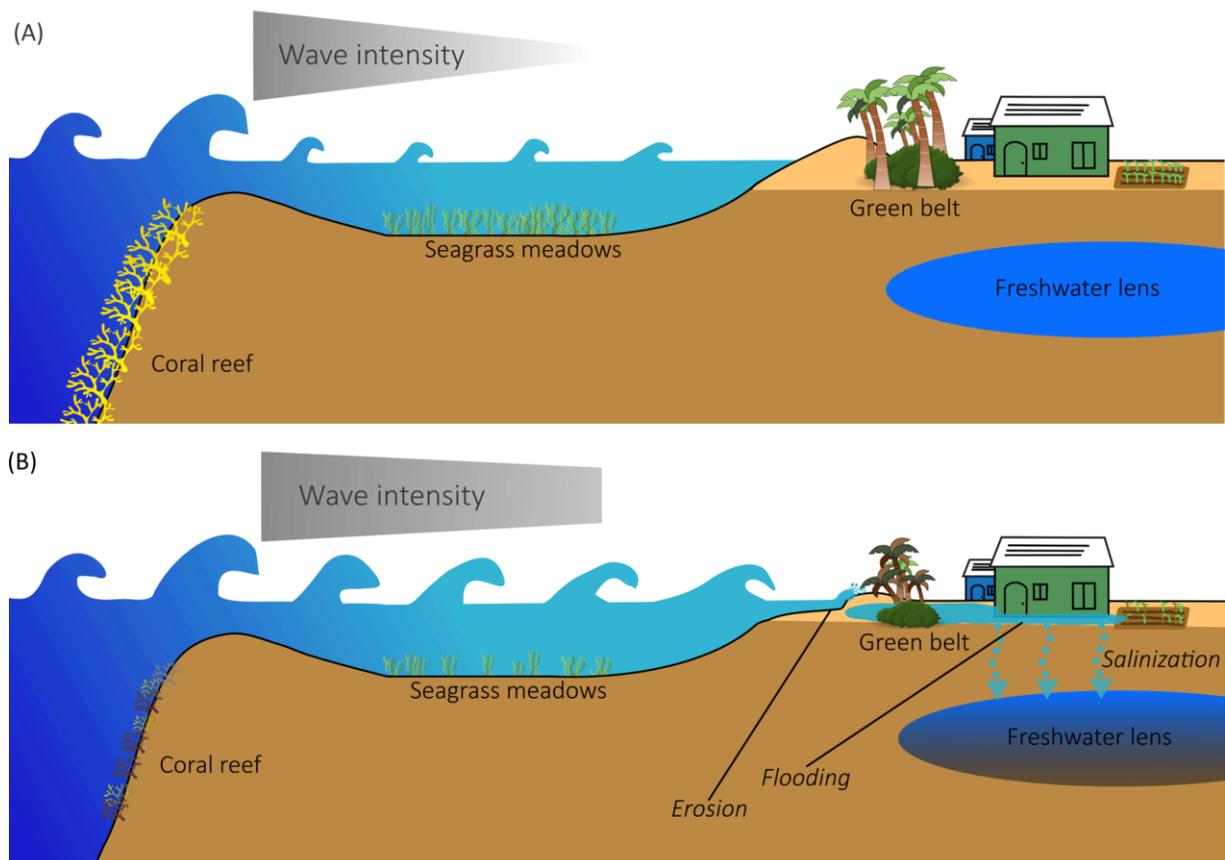
Coastal vegetation acts as a natural barrier to coastal hazards, as the vegetation consolidates sediments on coastlines as well as improves the stability of slopes, and thereby provides shoreline protection. Various studies have shown the positive effect of mangroves and other types of coastal vegetation for the stabilization of the shoreline. For example, mangroves are known to reduce wave heights as well as to maintain sediment balance which prevents erosion and can help in building up soil. In the Maldives, there is a vegetation belt that encircles the outer rim of inhabited islands, which is called heylhi.<sup>8</sup> The heylhi consists of a multitude of native vegetation types, including shrubs, trees, and mangroves. The first row of vegetation consists mainly of salt-tolerant plants like *scaevola taccada*, locally known as magu, and *heliotropium foertherianum*, which is locally known as boshi. Also, some larger trees can be found in the heylhi, like the *pisona grandis*, los, or *hibiscus tiliaceus*, digga (*Romero Frías 1999*). Traditionally, the villages on the islands were located in the middle of the islands, behind the coastal vegetation. The only buildings close to the beaches were huts for boat construction and repair. *Romero Frías (1999)* argues that the houses were built behind the vegetation to hide the settlements from views from the sea in order to secure privacy. Only sheds, where boats were worked on,

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<sup>8</sup> Excluding Male' and Hulhumale'

and shrines were built on the beaches. Additionally, he argues that the vegetation close to the coast protected the salt-sensitive plants in the island, such as the breadfruit trees, papayas as well as bananas. *Bremner (2017, 21)* describes the purpose of the heylhi to protect the islanders from “real and imagined threats” from the sea.

The coastal vegetation on the Maldives also has been harmed by anthropogenic interferences. Firstly, on various islands, there has been large-scale destruction of mangrove forests to build infrastructure, e.g., a domestic airport on Kulhudhuffushi (*Maldives Independent 2019a*). Furthermore, more and more islands have reported that coconut trees within the vegetation belt on local islands have been uprooted and shipped to resort islands, which is being termed as *tree grabbing* by environmentalists in the country (*Maldives Independent 2019b*).



**Fig. 11: Overview of the coastal protection services of islands’ coastal elements: (A) illustrates the coastal ecosystem in a healthy state: Incident wave energy is reduced due to the services provided by the coral reef, seagrass meadows, and the coastal vegetation. (B) shows the consequences of degraded coastal environment elements: Higher wave energy causes erosion, coastal inundation, and the salinization of the freshwater lens (own illustration)**

### *Effects of Local Anthropogenic Interferences*

As indicated above, local anthropogenic disturbances have impaired the coastal protection services provided by coastal elements on the Maldivian coral islands, especially those of the coral ecosystems. For example, *Kench (2012)* has identified four reasons why engineered coastal

structures fail in the Maldives: Firstly, on peripheral islands, structures are often built ad-hoc and without technical expertise. Secondly, engineered structures replicate the designs from developed countries and neglect the local process regime of the coast. Thirdly, the materials for the structures are often unsuitable for the tasks. And lastly, the construction process is generally lacking professionalism. According to *Duvat and Magnan (2019)*, local human disturbances, including the construction of engineered coastal structures, extraction of sediments, and land reclamation, are likely to have decreased the capacity of the islands' natural capacities to cope with marine-based pressures already. The authors stress the need to better understand the anthropogenic drivers that cause damages to them. Additionally, they argue for a necessity to develop island-specific adaptation strategies and to better consider these natural coastal protection services as they provide cost-effective protection services. Thus, it is necessary to understand these coastal elements as part of coastal protection that needs maintenance and protection.

The section has outlined coastal elements of the coral reef islands that provide coastal protection services, which make the islands – to a degree – resilient to changes. Nevertheless, the coastal elements that provide protection services are under pressure from climate change impacts as well as local human disturbances. These pressures have already had an impact on the island's coastal zones and are expected to increase in the future. The impact of anthropogenic activities on the natural coastal resilience is demonstrated in more detail in the context of the case study island, Fuvahmulah, in part 4.1.2.

### **Coastal Hazards**

The coastal hazards that occur in the Maldives encompass swell waves and wind waves, gravity waves, and tsunamis (*UNDP Maldives 2006*). The worst documented event was the 2004 Indian Ocean Tsunami, in which 82 persons died (*Kan et al. 2007*). The damage caused by the tsunami was estimated at USD 470 million, which made up approximately 62 percent of the country's GDP in that year. Furthermore, six islands became uninhabitable, and fourteen others were temporarily uninhabitable (*UNDP Maldives 2006, 21*). Apart from tsunamis, the exposure to the hazards differs in the different regions of the country due to the different influences by the climatic and geophysical conditions. For example, incident wave energy is higher in southern regions of the country (*Kench 2011*). Except for heavy rainfall and windstorms, all other hazards primarily lead to risks for the people through coastal flooding. From a historical perspective, minor coastal flooding events are common in the Maldives: at least 31 events have occurred between 1966 and 2015. These coastal flooding events generally cause only small amounts of damage, as the floodwater on average only reached 20 m into the islands, and the

## Study Setting – The Island(s), the State, and the People

depths of the floods were lower than 1 m. The flooding events are assumed to be the results of waves that were mainly generated by the winds of the southwest monsoon (*Wadey et al. 2017*). However, two large-scale flooding events have caused greater damage. In 1987, 16 islands in the central region of the Maldives were flooded by swell waves. Over 300 people were displaced by this event (*JICA 1998*). In 2007, a series of sea swells inundated 68 islands in 16 atolls. As a result of that event, 1 600 people had to be evacuated, more than 500 homes as well as coastal infrastructure, including harbors and jetties, were damaged (*UNOCHA 2007*). Also, on 33 islands, crops, agricultural farms, and vegetation were damaged by saltwater intrusion. Furthermore, 58 of the affected islands reported significant coastal erosion that was caused by the swell waves (*Inayath n. d.*). Coastal erosion, in general, is seen as a massive problem for the Maldives (Fig. 12). The process increases the likeliness of flooding in affected areas as the flood protection that the coast offers decreases. In 2004, 97 percent of the inhabited islands were suffering from beach erosion, and 64 percent reported severe erosion processes, and the government is anticipating further erosion due to the expected sea-level rise (*MEE 2015a*).

In the future, a sea-level rise of 0.40 to 0.48 m between 2001 and 2100 is calculated for the central and southern regions of the country (*MEE 2015a, 51*),<sup>9</sup> which will exacerbate the problems the country already faces today in regard to flooding events and erosion. The sea levels in



**Fig. 12: Coastal erosion on Fuvahmulah (own photo, 2019)**

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<sup>9</sup> Statements about the development of the sea level in the Maldives are difficult. The country has only three gauge stations and projections for sea level are inaccurate for the Maldives, as downscaling of global projections for the local level does not allow precise statements.

the Northern Indian Ocean rose by  $2.3 \pm 0.09$  mm per year between 1993 and 2015, which is a higher rate than the global average during the same period (*Swapna et al. 2017*). The Maldives is seen to be one of the most vulnerable countries to sea-level rise in the world: About 80 percent of the land of the country is located less than 1 m above the mean sea level, making the country's islands highly vulnerable to sea-level rise and associated ocean hazards (*Khan et al. 2002*). The risk is furthermore highlighted by the 42 percent of the population and 44 percent of human settlements that are located within 100 m of the coastline, including 47 percent of the houses and most critical infrastructure, such as hospitals, power plants, and airports (*MEE 2015a, 18*).

#### **4.1.2 The Island: Fuvahmulah**

Before scrutinizing how coastal issues on Fuvahmulah are perceived and understood as well as addressed by the actors in the following chapters, there is a need to understand the structure, processes, and problems of the island's coast. The following section gives an overview of the coastal situation on Fuvahmulah, beginning with an overview of the coastal environment of Fuvahmulah with a specific focus on the exposure of the island to coastal hazards and the islanders' vulnerability with regard to coastal changes.

##### **Fuvahmulah's Environment and its Dynamic Coast**

Fuvahmulah has a unique status within the islands of the Maldives, as it is the only island that is deemed administratively and geographically a "one island atoll" (*MEECO 2016, 20*). Fuvahmulah is located south of the equator and is the second-most southern atoll of the country (Fig. 9). Fuvahmulah is one of only four oceanic platform reefs of the archipelago (*Naseer and Hatcher 2004*) and is about 4.5 km by 1.2 km in size. With a total of 486 hectares of land area, it is the third-largest inhabited island of the Maldives (*MEECO 2016, 16*). In accordance with the structure of other Maldivian islands, the settlement areas of Fuvahmulah are all in close proximity to the coast: No house is located further than 650 m away from the coast (Fig. 13).

It is hypothesized that the island was a small coral atoll with a channel in the southwestern part of the island, which connected a saltwater lagoon in the inner part of the island to the ocean. However, the channel was closed off due to large coral boulders blocking the inflow of ocean water about 150 to 200 years ago (*MEE 2014*). Through evaporation processes followed by the accumulation of rainwater, the lagoon transformed into wetland areas with two lakes (*kulhis*) that are found in the northern and southern parts of the island that are present today (Fig. 13). A result of this formation process is the unique concave form of the island, with the low-lying wetland being encompassed by a high rim of coralline rocks (*MEE 2014*). This rim is among the highest found anywhere in the Maldives (*MEECO 2016*), which is likely to have formed as

a response to the wave energy the island is exposed to (*Kench et al. 2008*). The dry areas of the center are at about 40–55 cm above mean sea level, while the highest rim of the island is up to 4.5 m above mean sea level, which can be found in the north of the island (*MEE 2014*). The wetland area is characterized by high fertility, which makes Fuvahmulah one of the few islands in the Maldives in which crop production is possible. The crops include taro, watermelons, and banana trees, amongst others. Furthermore, the islanders are able to obtain water from the island's freshwater lens.

Fuvahmulah's coastline is approximately 15.3 km long, and the outer rim area of the island is hard underlying bedrock, composed mainly of hardened sand and coral conglomerates (*MEE 2014*). The island's coast is morphodynamically highly active, which is related to the wind and current regime that is influenced by the monsoon. A wind and wave-induced current regime leads to seasonal erosion and deposition processes on the island due to the natural sediment transport system of the reef. The two monsoon seasons lead to changed wave directions and wave heights in Fuvahmulah, which results in the transport of sediments along the shore (cf. *Kench et al. 2006*). This process is most visible on the popular beach of the island, *thundi*, in the north of the island (Fig. 13, Fig. 42). Due to these processes, *thundi* shifts from the northwestern part of the island in the dry season to the northern part in the wet season. In other words, while the northwestern part of the island is a sandy beach in the dry season, in the wet season, the cemented beachrock is visible. These processes are widely known to the local population on Fuvahmulah as seasonal changes. The most common components of the beaches are sand, pebble, cobble, granule, and boulders.



**Fig. 13: Overview of Fuvahmulah (own illustration)**

Two factors lead to high susceptibility to environmental forcing of Fuvahmulah’s coast. On the one hand, in contrast to most other inhabited islands of the country, Fuvahmulah is not part of a ring-shaped atoll (Fig. 9). Due to its geographically isolated location, the island does not have the protection of a lagoon, making it highly exposed to wave energy from all sides and to the

strong southwest monsoon winds. On the other hand, the house reef of Fuvahmulah covers an area of 546 hectares, and about 82 percent of it is covered by the land area of the island, which is a higher degree of saturation compared to most other islands in the country. Therefore, the reef is narrower in most parts of the island – excluding the southeast – and can absorb less wave energy (*MEE* 2014). Nevertheless, the reef remains essential for reducing the wave intensity reaching the coast of Fuvahmulah. Next to the reef, two other natural coastal protection elements on Fuvahmulah were identified. Firstly, Fuvahmulah’s high ridges have been identified to be highly effective against sea-induced flooding as they are higher than any engineered breakwater in the country (*MEECO* 2016). And secondly, the *heylihi* is an important part of Fuvahmulah’s coastal protection, which encircles the whole island, excluding the south of the island where the harbor has been built. Its width ranges from about 30 to 150 m and consists of coconut palms, sea-lettuce, sea-hibiscus, and screw palm (*MEEW* 2006) (Fig. 14). However, numerous coconut trees have fallen into the ocean, especially on the east coast, due to erosion problems. Furthermore, people on Fuvahmulah have reported that numerous trees have been cut down by authorities for the construction of the road on the west coast without following formal procedures to understand the environmental consequences (*Fieldnotes*, 1/21/2019).



**Fig. 14: The *heylihi* on Fuvahmulah (own photo, 2019)**

### **Coastal Modifications on Fuvahmulah**

As discussed before, coral islands have highly sensitive coastal systems, where interferences can have negative impacts on the processes that shape the coast. Coastal modifications on Fuvahmulah have led to environmental issues and influenced the opinions and interests of the different actors with regard to the coastal problems and how to address these; therefore, the coastal modifications and the reasons for their constructions are presented in the following.

#### *Access Channels*

The open ocean location of the island and its exposure to the waves as well as the shallow reef made it difficult to access the island by boat: Until 2003, the island of Fuvahmulah could only be reached by boats through ten access channels that were created through reef blasting and removal of the coral debris (Fig. 15). The numerous access channels were necessary as the wind

and wave conditions make the usage of individual channels on certain days impossible. Furthermore, interviewees on Fuvahmulah stated that the competition between the people of the different parts of the island has led to the situation that each ward – the subdivision of cities in the Maldives – has built at least one access channel. Yet, the channels have been identified to increase erosion processes in the proximity of the channels and to increase the risk of coastal flooding by the islanders.



**Fig. 15: Access channel on the west coast of Fuvahmulah (own photo, 2019)**

### *Fuvahmulah's Harbor*

While the access channels allowed easier access to the island for smaller boats, larger sea-going vessels were still unable to reach the island. Smaller boats transferred people and goods from larger ships that had to remain outside of the reef rim to the Fuvahmulah's coast. On a regular basis, the transferring smaller boats capsized due to the difficult conditions, leading to deaths and injuries. A harbor was widely demanded by the islanders as a necessity to improve the accessibility of the island and to support the island's economic development. The harbor, located on the southeast tip of the island, opened in 2003 and has been an important driver for the development of Fuvahmulah. The harbor facilities encompass a boatyard, a marketplace and are important for the increasing diving tourism activities based on the island. The harbor is protected by a revetment composed of tetrapods and rock boulders (Fig. 16). The original revetment protecting the harbor was insufficient as waves were able to overwash it. In 2017, during the Yameen presidency, the revetment was extended. Harbors on the Maldives are constructed by blasting the coral reefs with dynamite to create a path for boats. The chosen location

of the harbor has been under scrutiny since the beginning, and interviewees have discussed that the selection of the location was a political decision made by actors on the highest level in Male'. Since the construction of the harbor, the islanders have perceived a “mountain” (SII 020, 43) on the west side of the harbor and described that the harbor is blocking the sediment transport around the south tip of the island. A study by *David et al. (2020, in review)* has established that the harbor acts as a barrier to sediment transportation and interferes with the morpho- and hydrodynamic system, and causes significant coastal erosion on the east coast of the island.



**Fig. 16: Fuvahmulah's harbor (own photo, 2019)**

### **Coastal Hazards of Fuvahmulah**

Two coastal hazards pose a risk for Fuvahmulah. Firstly, erosion processes increase the likelihood of flooding due to the breaching of the island's ridge. Secondly, waves and high-water levels can lead to overtopping of Fuvahmulah's ridge and also result in flooding events. And thirdly, the salinization of the freshwater lens is seen as a serious problem that is caused by overwashing events (*Royal HaskoningDHV 2016*). All hazards are expected to worsen on Fuvahmulah as a consequence of climate change in the upcoming decades: On the one hand, the sea level is expected to further rise in the Indian Ocean, and on the other hand, it is anticipated that the region will be affected more often by extreme weather events, like storms (*Dangendorf et al. 2019*). The issues are presented in more detail in the following.

#### *Coastal Flooding*

Even though the high coastal ridge is seen as highly effective in protecting the island from flooding, Fuvahmulah is affected regularly by swell waves that breach the high ridges. Records suggest that Fuvahmulah has experienced flooding events numerous in the past. Since 2000, there have been at least 12 flooding events (Tab. 1). Interviewees have observed that the areas close to the dredged channels are especially prone to flooding. The bowl-like form of Fuvahmulah leads to the problem that floodwater – originating either from rain or sea – within the ridge of the island is unable to drain easily into the ocean. To increase the outflow of the water, four drainage pipes have been built in Fuvahmulah that guide water from the inside of the island to the ocean. The risk of coastal flooding in Fuvahmulah is almost certain to increase in the future

under a projected sea-level rise between 0.4 m and 0.8 m. It is likely that extreme events that have only rarely occurred in history will become common by 2100 under all RCPs in Fuvahmulah (Oppenheimer et al. 2019). A higher mean sea level leads to higher waves, making it more likely that the waves breach the ridges. Through coastal flooding, the groundwater lens of Fuvahmulah has been negatively affected through intruding saltwater. Numerous events on Fuvahmulah have been recorded that have negatively affected the groundwater lens on the island (Tab. 1). The groundwater lens is one of the few sources of the coralline islands of the Maldives for freshwater. Groundwater is mainly used for farming and washing purposes on the island; however, local inhabitants reported that it is also used as drinking water (*Fieldnotes*, 3/16/2017).

#### *Coastal Erosion*

Severe rates of erosion have been observed on Fuvahmulah, primarily on the east coast (Fig. 17). The erosion processes are assumed to increase the intensity and the frequency of flooding events. According to an environmental impact assessment report, about 15 hectares of vegetated land has been eroded on the island's northeast coast in the years from 1969 and 2016 – about 0.8 m of land every year (MEECO 2016, 85). The study by David et al. (2020, in review) established that the erosion rate is particularly high just north of the harbor, where the currents and waves dislodged coral rocks and washed the sediments out under the roots of the coastal vegetation. Due to the severity of the erosion process, Fuvahmulah ranked as the highest priority in need of a coastal protection structure at the national level (MEECO 2016).



**Fig. 17: Coastal erosion on Fuvahmulah's east coast (own photo, 2019)**

**Tab. 1: Fuvahmulah: Coastal flooding and erosion incidents since 2000 (MEECO 2016, 151, Personal communication, 01/20/2019)**

Year	Month	Incident and extent of the incidents
2005	October	High waves affecting the island.
2007	May	Flooding and salinization of groundwater in wells through swell waves.
	July	East coast: Large beachrock dislodged recorded by island office. 2 coconut palms fell.
	October	East coast: Wave action caused a beachrock to dislodge at the coast in the Maalegan area.
2008	May	East coast: A large piece of beachrock (11x1.5m) was dislodged at the coast in the Maalegan area.
	July	North coast: Flooding through tidal waves reaching up to 60 m inland, causing the salinization of groundwater wells. This caused problems for the farmers that were not able to use the wells for the watering of their crops.
	August	East coast: Wave action caused a beachrock (9x3x1m) to become dislodged at the coast.
	December	East coast: Strong wave action caused fractures to beachrock in three different areas. Coconut palm trees fell. Three large beach rocks were dislodged by the wave action.
2009	January	Northeast coast: High waves flooded areas up to 50 m away from the coast. The seawall in Rasgefannu was overtopped by the waves. The groundwater wells of the houses and the drainage system in the area were affected.
2011	August	West coast: Ocean swells caused flooding that reached up to 30 m inland without causing major damage. Wave heights were recorded at about 3 m, according to the National Meteorological Center.
2013	February	East coast: Flooding through swells in the Maalegan area reaching about 27 m inland. Loss of vegetation and beach erosion was reported. No damage to property was reported.
2018	April	West coast: Flooding in the Dhiguvaandu area on the western coast of the island. Some damage to the main ring road around the island that needed to be repaired after the flooding and some limited damage to houses.

#### 4.2 The Political Context of the Maldives

In the following, an overview of the evolution of the Maldivian political system with two foci is given. The first part briefly analyzes the development of the political system in the Maldives with a focus on the back and forth between centralization and decentralization and authoritarian and democratic approaches during the different governments. The section commences with a brief outline of historical circumstances before going into more detail regarding the development during the last three presidencies. At the same time, the relationship between the political

center of the country, the capital Male', and peripheral islands are highlighted. The motivation for this part is to highlight the different approaches taken by the presidents and to show how this has resulted in uncertainties regarding the allocation of the responsibilities on the various governance levels. It furthermore highlights the shifts in how the population was able to interact with other actors. The general level of analysis is the national level while also discussing interactions with the international and the local levels. However, this part is not an attempt to give an in-depth analysis of the political quarrels of the country. For a deeper look into this, the book *The Maldives: Islamic Republic, Tropical Autocracy* by Robinson (2015) summarizes the political quarrels until 2015 in detail. The second part provides an overview of the environmental priorities as well as utilized discourses of the Nasheed and Yameen administrations. This allows understanding what political discussions and discourses have shaped the opinions and interests of the involved actors in the context of environmental and coastal issues.

#### **4.2.1 Brief Historical Overview of the Development of the Maldivian Political System: the Maldives as a Centralistic Country**

Before going into more detail about the developments of the political system since 1978, a brief outline of how the Maldives were governed before is given in the following to understand the roots of the centralistic approach that has coined the Maldivian political system.

The borders of the country of the Maldives have barely changed since medieval times.<sup>10</sup> The same is true for the allocation of power that has not significantly shifted since the 4<sup>th</sup> century: the power of the country has been located in the political center of the country in the Maldives, Male', where in the past the King (*ras*) and later the Sultan governed and where today the seat of the government is located. Only due to the spatial expansion of the islands, the ruler had to make use of intermediaries to exercise his power on the peripheral atolls and islands. Starting in the 17<sup>th</sup> century and continuing until the 1980s, the atolls of the country were led by an atoll chief, called *naib* and *atholhuverin*. The responsibilities of the atoll chief gradually expanded over time, and he was responsible for overseeing the legal, administrative, and educational affairs as well as assisting the ministries in development projects of the atoll. These atoll chiefs were appointed by the Sultan, just as the deputies that supported the atoll chiefs. On the local level, there were *katheebun* that was responsible for reporting to their atoll chief (*Al Suood* as cited in *Transparency Maldives* 2019, 9). While the island chiefs were generally residents of

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<sup>10</sup> The exception is the island of Minicoy. This island located about 100 km in the north of the northern-most island of the Maldives, Thuraakunu, which was part of the Maldives until the mid 18<sup>th</sup> century. Today, the island that is part of the Lakshadweep archipelago is governed by the Republic of India.

the islands they administered, atoll chiefs were often transferred to the atolls to underscore the power of the Sultan. This approach is effective until today, and the atoll chief directly reports to the president and shall do his work in the atoll according to the instructions of the president. Furthermore, the appointments of these positions were based on political calculation and not on merit. In sum, both the atoll chiefs and the katheebun were seen to be exercising the power of the central government rather than representing the people on the atolls or islands (*The National Democratic Institute for International Affairs* 2004, 43–44).

Various historical examples show how the political elites in Male' have attempted to centralize power in the capital by limiting the autonomy of peripheral atolls and islands. The great extent of power that the King possessed in former times is told in various folk tales that have been documented by the Spanish ethnographer *Romero Frías* (1999) in his book *The Maldive Islanders*. In these tales, the kings are described as arrogant, greedy, and brutal towards their subjects and claim absolute control over the land and people. *Romero Frías* (1999, 49) summarizes the reigns of diverse Maldivian monarchs as follows:

“Maldivians had no control of their own lives; they lived in a feudal system in which their well-being depended from their total submission to the king. When the royal power felt itself threatened, all other considerations became secondary and even the law, which an angry *Radun* [king] could easily override, offered no protection. Since there was no place to hide in the Maldives, life became impossible for anyone falling in trouble with the king, no matter how honest or law-abiding.”

The centralistic and authoritarian approach to governing manifested itself in more practical ways as well: For example, by order of the Maldivian monarch, all vessels that brought products from other countries had to touch the country in Male' and were only allowed to trade their goods there, thereby providing the elites complete control of who entered the country and what products were imported (*Romero Frías* 1999). Especially during the time of King Muhammad Fareed Didi (1954–1968), islanders were discontent with decisions made by the ruler in Male' and these “harsh and insensitive policies disgusted them with the central government” (*Romero Frías* 1999, 23). Lacking consideration of the needs and wishes of the islanders in the peripheries resulted in the most significant independence movement in the country's history from the three southernmost atolls in the mid-20<sup>th</sup> century. The three most southern atolls of the country, encompassing the atolls Addu, Huvadhu, and Fuvahmulah, have had historically close ties with one another resulting from a unique identity within the country, shown by their similar shared

dialects amongst others. In 1959, the *United Suvadive Island Republic* was proclaimed under the leadership of Abdullah Afifu that lasted only until 1963. The republic was never recognized by any other nation, and their leader was exiled to the Seychelles (*Romero Frías* 1999). *Romero Frías* (1999) did not find any remaining traces of the independence attempt or of a common unique identity between the three atolls that distinguished them from the rest of the country during his studies in the country.

The Maldives have only lost their independence twice for short periods of time. An attempt by the Portuguese to brutally colonize the Maldives from 1558–1573 failed in the long term due to organized resistance from the people of the islands. The second brief loss of independence was from December 1752 to April 1753, when Malabars from South India ruled the Maldives (*Maldives Independent* 2015). However, due to the experience of the Portuguese and because the country was seen to be volatile for Europeans due to sicknesses, such as Malaria, the Maldives were never colonized again but were under protectorate from, successively, the Netherlands, France, and the United Kingdom (*Maloney* 2013). The protectorate of the United Kingdom lasted for the longest time, from 1887 to 1965. There were, however, no attempts to missionize the country – it was mainly for the strategic military aims of the British, and the domestic politics were left to the Maldivians (*Robinson* 2015). Remnants of that time are the former Royal Air Force Station in Gan / Addu Atoll and the membership of the Maldives in the Commonwealth of Nations.

In 1965, the Maldives achieved full political independence after an agreement between Prime Minister Ibrahim Nasir and the British government was negotiated, which ended the British protectorate. In 1968 the Maldives transformed from a sultanate to a republic that ended the 853-year-old sultanate – which, however, did not affect the centralistic approach to governing the Maldives, as shown in the following.

### **1978–2008: The Republic under Gayoom**

In his three-decade lasting rule, Maumoon Abdul Gayoom continued with the centralized approach to governing the country and concentrated most government power in his own person like his predecessor Nasir (*Buncombe* 2008). The Maldives was a one-party state, and Gayoom's approach to governing was described as highly authoritarian. In general, the legal framework gave priority to one strong main executive and did not distribute power to the communities on the islands. The Constitution of 1968 stated that supreme authority regarding the matters of government, which included administrating the dealings of the atolls as well as all islands, lies in the position of the president (*Transparency Maldives* 2019).

However, in the 1980s, Atoll Development Committees (ADC) and Island Development Committees (IDC) were introduced that aimed to strengthen the actors on the lower levels. These committees were created to support atoll chiefs and katheebuns on development matters and land use planning, amongst others (*Zahir* as cited in *Transparency Maldives* 2019). The Atoll Development Committees were chaired by the atoll chiefs and further included about ten to twenty representatives of IDCs. These representatives were appointed by the Ministry of Atolls Development. IDCs consisted of five to ten island inhabitants that were partly appointed by the atoll chief and partly selected by the community members. Women were not barred from being on IDCs, but female members were the exception. Nevertheless, they were allowed to vote for the composition of the ADCs as well as the IDCs (*Transparency Maldives* 2019). From 1979 onwards, Island Women’s Development Committees (IWDC) began being established on all Islands of the Maldives – by 1992, all inhabited Islands had an IWDC. These IWDCs organized numerous activities from cleaning services, training courses for tailoring, as well as contributing to the IDCs (*Transparency Maldives* 2015). These island-based committees were a first step towards integrating the lower levels more strongly in governing. It was mandatory to consult with the ADCs, IDCs, and IWDCs regarding community affairs, including in the planning programs by the national government that affected the communities within the sector, policy, and program planning (Regulations of the IDCs and ADCs) (*Transparency Maldives* 2019).

#### *Internal and External Pressure to Reform*

The Gayoom administration was regarded as corrupt and lacking democratic values by the opposition and international observers (*Robinson* 2015). In the early 2000s, the pressure on “Asia’s longest-serving dictator” (*Robinson* 2015, xviii) to reform grew inside and outside the country, especially from the European Union (EU). A resolution of the EU demonstrated this clearly when it designated the Maldivian government as a dictatorship. In consequence, the EU ceased all humanitarian aid transfers and prohibited members of the government from traveling to the European Union in 2004 as a reaction (*Arndt* 2008). Rising pressure on the Gayoom government to reform due to large-scale and partially violent protests in 2003, widespread doubts about the legitimacy of the 2003 election, and the aftermaths of the 2004 Indian Ocean Tsunami led to the undertaking of constitutional reform (*Robinson* 2015). Regarding the disaster response after the 2004 tsunami, foreign donors agreed to support the country financially only under the conditions of democratization processes being initiated (*Shenk* 2012). Gayoom’s administration developed a *Roadmap for Reform Agenda*, which led to the constitution that included a democratic system of government and guaranteed political and civil liberties for the people of the country for the first time in the history of the country (*Transparency Maldives*

2019, 8). It also introduced the principle of decentralization into the governance framework of the country that aimed at empowering local communities. In consequence, political parties and elections were introduced to the political realm of the Maldives. However, the struggles of the country to cope with the devastating effects of the Indian Ocean tsunami in 2004 in the aftermath of the ratification of the new constitution impeded the process of the implementation of decentralization activities (*Transparency Maldives* 2019).

### **2008–2012: An Attempt at Decentralization by Nasheed**

In the first democratic Presidential Election in 2008, Mohamed Nasheed of the Maldivian Democratic Party (MDP) was voted into the President's Office of the Maldives. Nasheed was a long-time opposition politician that had been imprisoned and in exile for years during the Gayoom presidency (*Robinson* 2015). Central campaign promises by Nasheed's run for the President's Office were the democratization and decentralization of the country. Nasheed's government dissociated itself from the authoritarian governing style of Gayoom and pushed a more democratic style of government with a focus on decentralized structures. Decentralization reforms were implemented that shifted the formal institutions towards a decentralized governance structure (*Jaleel* 2013). The decentralized structures focused on more empowerment of the local government and affected communities. An example of how the Nasheed administration attempted to empower the local communities was the development of the guesthouse policy in tourism. The guest house policy allowed local island-based tourism and was an attempt to strengthen the economic situation on the inhabited islands (*Bowen et al.* 2017). The community's significant role in development projects in Nasheed's administration is underscored in part 4.2.2.

#### *End of Nasheed's Term of Office*

In 2012, various large-scale demonstrations protesting the arrest of a senior judge took place, which resulted in the end of the Nasheed presidency. These demonstrations were widely deemed to be instrumentalized by the main opposition party, the Progressive Party of the Maldives (PPM), that aimed to return to power. The PPM was widely seen to be the party of the former political elite, as Gayoom was a member of the party. As a result of the demonstrations, Nasheed was removed from the President's Office on February 7, 2012. While Nasheed and his supporters have described the political take over as a coup and was "forced to resign at gun-point" (*Jones* 2012, para. 1), his opponents claimed it was a democratic process. The removal of Nasheed resulted in violent clashes between the police and his supporters, who accused the

police of excessive force and torture in the aftermath. International observers also criticized the forcible removal from power (*Robinson 2015*).

Even though the removal from office was widely viewed as undemocratic by international observers, analysts have identified reasons for a growing discontent with Nasheed's government in the population – with one of the main problems being that Nasheed focused too much of his politics on environmental problems and climate change issues. By doing this, he failed to acknowledge the problems of the daily lives of the Maldivians, such as housing problems and unemployment, and thereby lost the support of the population (*Arnall and Kothari 2015, Kothari 2014*). Furthermore, his strong propagation of the idea of relocating the population to another country as a response to climate change impacts was seen as too extreme by many Maldivians, which led to a decrease in his popularity (*Kothari 2014*).

Nasheed's reelection attempt failed in the Presidential elections in 2013 by a small margin. While the election process was assessed as free and fair by national and international observers with high voter turnouts, the Supreme Court heavily interfered in the run-up to the election, which was heavily criticized by the MDP and its supporters (*Robinson 2015*). In 2015, Nasheed was imprisoned based on terrorism charges related to the arrest of the judge. Numerous external observers characterized the trial as a show trial. The imprisonment led to the national mobilization of his supporters and the increase of international pressure on the new government of the Maldives. The aftermath of these developments is the increase of political rifts in the society of the country – first and foremost between the supporters of the two main parties (*Transparency Maldives 2019*).

### **2012–2018: Yameen's Return to Centralism**

The successor, Abdulla Yameen from the PPM, shifted away from the democratic-oriented style of Nasheed's presidency towards a more authoritarian approach. The decentralization efforts were rolled back, shown by the process of removing the responsibilities and powers of the city councils and retransferring them to the national government. In the third amendment to the *Decentralization Act* in 2015, the parliament passed the change that the president can determine the responsibilities and powers of the city councils. Also, it is stated that the council's responsibilities can be altered by the executive branch of the government. Shortly thereafter, the President's Office curtailed the city council's responsibilities and powers regarding, inter alia, the tackling of erosion problems and the management of harbor maintenance as well as road management (*Transparency Maldives 2019*). It has been reported that atoll and island councils have not obtained the transfer of assets, and there is no clarity for the councils over the management

of the resources. In comparison to 2008, the Atoll and Island and City Councils stated to have significantly less power and fewer opportunities to raise revenue (*UNICEF* 2013).

Political observers identified deterioration of political participation and pluralism during Yameen's time in the President's Office as the opposition leaders and supporters were subject to judicial harassment: political rallies were restricted, and oppositional politicians were subject to convictions leading to a high degree of political tensions (*Freedom House* 2020). Under the Yameen administration, democratic liberties eroded, and space for civil activities declined. A prime example of the undemocratic governing style of Yameen was the declaration of a 45-day State of Emergency in 2018 as a response to the defection of 12 of his party members to the opposition party, which could have resulted in his removal from office (*Al Jazeera* 2018). Yameen's authoritarian style of governing, particularly the neglect for human and media rights, as well as the jailing of political opponents and forcing them into exile, were criticized by the European Union and led to a sanctioning of political leaders (*Jordan* 2018). On a similar note, Yameen revoked the membership in the Commonwealth of Nations because he felt unfairly criticized for the treatment of human rights during his years. The exit from the Commonwealth reflects the degrading relationship of the Maldives with the western powers during the Yameen administration, which was strongly criticized by MDP politicians and increased the tensions between the parties and their supporters (*Aneez* 2016).

### **2018–present: Solih's Term**

In the presidential election in late 2018 and the parliamentary election in April 2019, the MDP won the elections, and the MDP politician Mohamed Solih became the new president of the country. This election meant another turn of the policies. President Solih called decentralization the most significant promise of his administration to allow national development, stability, and peace to the Maldives (*The President's Office* 2019). In 2019, in order to revive the decentralization process, the 8<sup>th</sup> Amendment to the *Decentralization Act* included in-depth changes, including the financial empowerment of the councils, an increase of the representation of women in the decision-making process on islands, and introduced a quota for females in the council of 33 percent (*Malsa* 2019).

After focusing on the important political developments (Fig. 18), the following section focuses on the different foci of the Nasheed and Yameen administrations with regard to environmental issues in the context of climate change

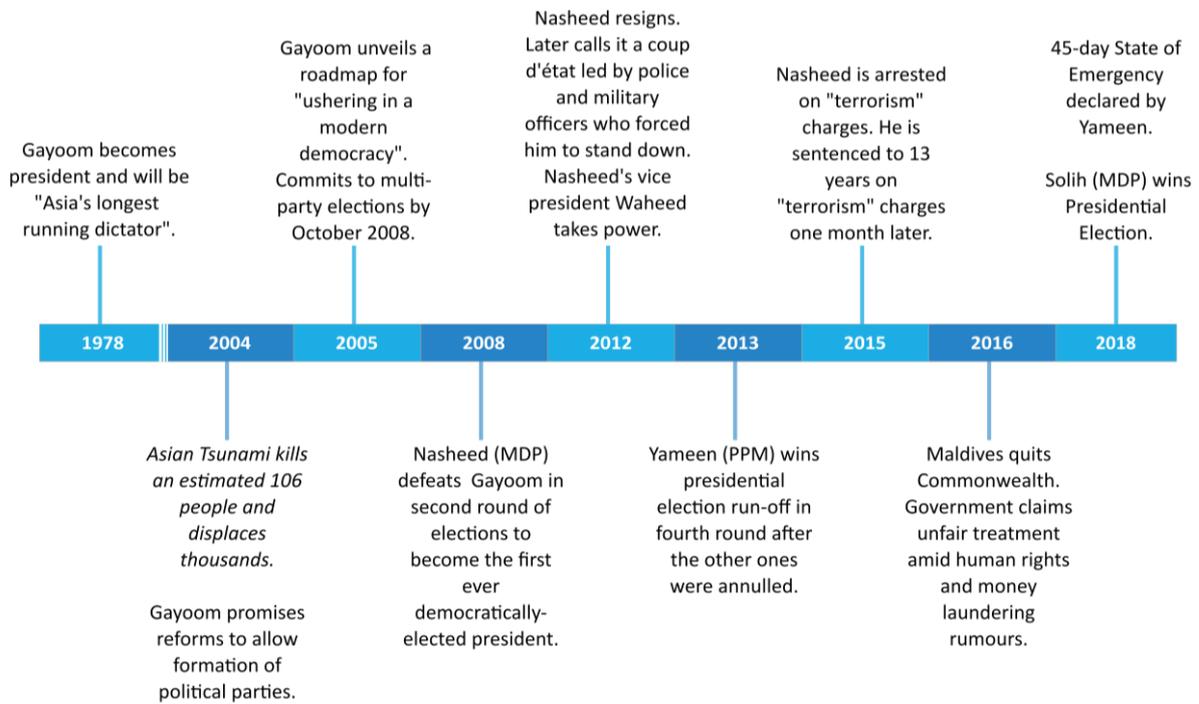


Fig. 18: Important events in Maldivian politics (1978–2018) (own illustration)

#### 4.2.2 Differing Foci of the Nasheed and Yameen Administrations in Environmental Politics

Environmental problems and how these problems are dealt with are central topics in the political agendas of the Maldivian national government as well as other political parties (Robinson 2015, Hirsch 2015). First and foremost, climate change, sea-level rise, and associated coastal hazards have received immense attention from the political elites of the Maldives, and the national governments have used climate change to push their agendas and interests (Malatesta and Di Schmidt Friedberg 2017, Kothari 2014). However, the different governments stressed different aspects of the phenomena and how to approach them depending on their aims. In the following, the significant differences in the approach are highlighted to allow a clearer picture of the discourses and approaches that have potentially influenced the actors on the multiple levels. As it was shown in the interviews and in the survey that the current political rivalry between the MDP and the PPM has influenced the population's perceptions and opinions most strongly, the focus is on the differences in the approaches between Nasheed (2008–2012) and Yameen (2013–2018).

Climate change was a central topic of Nasheed's tenure, which is shown by how he used climate change as a central device to achieve his campaign promise of a more democratic style to govern

(Hirsch 2015). Highly important to this attempt was the mobilization of the Maldivian population behind his plan to decarbonize the country that ultimately aimed to catalyze civic and enterprise engagement. Another idea that Nasheed promoted was a plan to make the Maldives the first carbon-neutral country by encouraging business ideas by private companies as well as public-private partnerships to achieve a transformation to a carbon-neutral state profitable. Hirsch (2015, 194) also pointed out that Nasheed and his cabinet used extreme rhetorical style to frame climate change, characterizing their approach to combatting climate change as a “national security issue” and even a “world war effort”. On a similar note, Nasheed’s administration prominently suggested that the people of the Maldives need to relocate and buy land in Sri Lanka, India, or Australia (Hirsch 2015). By pushing this narrative of urgency to act on climate change, he attempted to unify the Maldivian people behind the topic and form a united political community. Furthermore, the war-related terminology was supposed to legitimize Nasheed’s different approach to the President’s Office. Nasheed’s strategy aimed at various levels: On the international level, these “gestures meant to communicate to the world that the climate crisis is, indeed, real.” Hirsch (2015, 193) The plans were meant to show the international community that the country is doing everything in their hands to combat climate change. A prominent worldwide example for raising attention to the situation of the Maldives and small islands, in general, was the underwater cabinet meeting in October 2009 of Nasheed and ministers, where he tried to make the Maldives the “canary of climate change”, by stating “If Maldives can’t be saved today, we do not feel that there is much of a chance for the rest of the world” (Omidi 2009, para. 10). How successfully he utilized the different means on the international level was shown in 2010 when Nasheed was chosen as the recipient of the “Champion of the Earth Award” by the United Nations Environment Program (Ortega 2010, para. 1). This award also provides an indication of the prominence that he and the Maldives had in the context of climate change discussions during this period for their efforts. On the national level, it was attempted to utilize climate change adaptation to develop a feeling of unity in the Maldivian population after the years of being autocratically governed in the Gayoom-era. This was complemented by also specifically addressing the local level: the Nasheed government also attempted to mobilize individuals and groups on the local level and to get them involved in the efforts to combat climate change and the effects on the nation. All in all, Nasheed’s aim was to develop civic participation and to develop a sense of national citizenship and geopolitical identity (Hirsch 2015).

During Yameen’s administration, climate change played a less significant role. Various scholars and newspaper reports analyzed that the focus of Yameen’s presidency was to strengthen

the economy of the Maldives by prioritizing large-scale development projects, mostly the construction of large infrastructure projects like airports and harbors. One prominent project in this regard was the Sinamale' Bridge, also called the China-Maldives Friendship Bridge, connecting Male' with Hulhule' and Hulhumale'. The bridge was inaugurated in 2018, of which USD 126 million of the USD 210 million costs were paid by the Chinese government as a grant in aid (*Visham* 2016). This is not to say that Yameen ignored the potential problems the country was facing concerning climate change, as he was aiming to develop a financial foundation to adapt the country to the climate change impacts by large-scale investments (*Vidal* 2017, *Malatesta* and *Di Schmidt Friedberg* 2017). Simultaneously, the country has been less present in the international climate change arena. The administration focused more strongly on the attraction of foreign investments.

### 4.2.3 Current Political System

After delineating the processes that have shaped the political structure in the recent past, the following section discusses the current structure of the political system. This overview offers an insight into the structures that frame coastal governance, which is provided in the next chapter. It furthermore discusses how corruption has been an influential factor in Maldivian politics.

The Maldives is a democratic republic, and the government system of the Maldives is divided into national, regional, and local levels. The president is the head of state and of the government, which is directly elected by the electorate for a maximum of two five-year terms. The parliament of the country, known as the People's Majlis, has 85 members that are elected from multi-member constituencies, also for a term of five years. After the *Decentralization Act* was passed in 2010, which introduced local government policy in the Maldives, atoll councils (regional authorities) and island councils (local authorities) were established. Three atolls have obtained the city status, meaning that they are governed by a city council, including Fuvahmulah (*CLGF* 2015). Unlike islands, the cities are not under the two-tier local government framework of island councils and atoll councils but are supported by ward councils that have a similar role as island councils (*Transparency Maldives* 2019). The city councils are responsible for the following services: providing roads, water, electricity, and sewage systems, amongst others. The state allocates funds every year to the councils for the provision of services, office administration, and development projects, including alleviation of coastal erosion and the maintenance of breakwater installations off the island and jetties (*Ministry of Home Affairs* 2010). Councils are able to charge rents and fees for services they provide; they can ask for loans and create financial instruments such as bills and securities to fund development activities (*CLGF* 2015).

According to the *Decentralization Act of 2010*, the local governments are overseen by the Local Government Authority (LGA). The LGA is responsible for advising local governments on the formulation of by-laws and regulations (*CLGF 2015*). The aim of the decentralized governance system is to: “allow the island communities to make their own decisions in a democratic and accountable manner; to improve people’s living standards through social, economic and cultural development; to empower the people; to an increased scope bring the services closer to the people, and to create an environment conducive for peace and prosperity.” (*Ministry of Home Affairs 2010, 2*)

The role of the Women’s Development Committees has been strengthened in the *Decentralization Act*, and they have received a more participatory role with regard to governing the development affairs on inhabited islands. It is stated that under each island council or city council, in articles 35 and 57, respectively, a WDC has to be established that is elected by the community’s women. According to the *Decentralization Act*, the role of the committee is to advise the island or city councils regarding development affairs. A report by Transparency Maldives in 2014 noted that 61 WDCs were registered with the LGA and that 70 percent of the WDCs were active. However, the report also stated that 55 percent of the committees reported that they were not consulted by the councils (*Transparency Maldives 2015*).

### *Corruption*

Corruption is a highly influential feature in Maldivian politics. In the following, its manifestation is presented with a specific focus on environmental projects. The influence of corruption on the democratic processes as well as on the commitment of actor groups is shown. Corruption is and has been a major factor for decades in the Maldives. In 2018, the Maldives was ranked 124<sup>th</sup> out of 180 countries on the 2018 Corruption Perceptions Index by Transparency International, with a score of 31 (*Transparency International 2019, 3*).<sup>11</sup> The research institute *Freedom House (2020)* declared that corruption was widely distributed on all levels of government in the Maldives. During election time, the buying of votes is flagrant and seen as an important way to influence elections (*Robinson 2015*).

Especially, the processes behind the awarding of contracts for large infrastructure projects have been criticized as being opaque, where analysts assume that bribes are generally part of the deal. In 2018, research revealed that at least 50 islands were leased without public tender in Yameen’s presidency in 2014–15 (*Freedom House 2019*). Furthermore, corruption has been

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<sup>11</sup> 0 standing for highly corrupt and 100 for very clean.

identified as a barrier to sustainable development as well. *Transparency Maldives* (2015) stated that stakeholder involvement and the participation of lower levels of government are made more difficult by non-transparent decision-making processes and the lack of accessible data on climate change adaptation projects. During Yameen’s presidency, journalists and whistle-blowers that investigated corruption were forced into exile due to political persecution, and others were incarcerated (*Freedom House* 2020). However, Transparency Maldives sees promising political developments in the country because of public mobilization against corruption and a high voter turnout in the Presidential elections in 2018 and the Parliament election of 2019 that led to the election of the new government, which are putting a focus on fighting corruption (*Transparency Maldives* 2019).

After putting the spotlight on the political system on the national level, the following section briefly takes a look at the administration structure on Fuvahmulah.

#### **4.2.4 Fuvahmulah’s Administration**

Fuvahmulah belongs to the administrative division *Gnaviyani Atoll* and is the only island of the Maldives that is simultaneously an atoll. Since 2017, after being designated as a city one year before, Fuvahmulah has a city council with three city councilors – one for each part of the island: north, central, and south. The head of the island is the mayor, one of the councilors. The city council has the authority to raise fees for services, which are mostly derived from tourism activities on the local islands. City councils are generally involved in the strategic development of the island as well as everyday issues of the island (*Transparency Maldives* 2019). Fuvahmulah’s city council has three councilors that are elected for three years by the people of the administrative area. Two of the councilors, including the mayor, are MDP members, and the third council member is a PPM member. Because the island is governed by an MDP majority, Fuvahmulah’s relationship with the national government during the Yameen administration was seen to be quite tense due to the strong rivalry between the two parties and has resulted in lacking collaboration. A local inhabitant on Fuvahmulah believed that the national government was not interested in collaborating with the city council due to the political rivalry between the parties (*Fieldnotes*, 2/12/2019).

### **4.3 The Societal Context: The People of Fuvahmulah**

In the following, the characteristics of Fuvahmulah’s population that are relevant for the assessment of adaptive capacity are discussed. Next to general information on the population, a special focus is put on aspects that shape adaptive capacity, such as factors that have influenced social cohesion. Some factors embedded in Maldivian society lead to close relationships of the

Maldivian people, enabling social cohesion, while other factors caused tensions and societal problems, which have resulted in “a crisis of social cohesion” in the country, as the newspaper *Maldives Independent* titled it in October 2019 (*Thayyib* 2019, title).

Fuvahmulah is the third-largest island of the Maldives as regards the population size. According to the last census of 2014, Fuvahmulah had a resident population of 8 510, of which 7 984 were Maldivian, and 526 were foreigners. Of the total population, 4 085 were male, and 4 425 were female (*NBS* 2015a, 31). The population of Fuvahmulah is young, with a majority of inhabitants under 30 (60 percent). According to the collected data and interviewees, the majority of the population was native to Fuvahmulah. The education level of the population in Fuvahmulah is high, which is shown by the literacy rate. At 98.5 percent, Fuvahmulah has a slightly higher literacy rate than Male’ (98.1 percent) (*NBS* 2015a, 11), which is uncommon for peripheral islands as Male’ is considered to have the best education conditions of the country. In general, the country’s literacy rate is above the average rate for South Asia (89 percent) with 98 percent for the population over the age of 15 in 2016, with the literacy rate for women being slightly higher (98 percent) than that of men (97 percent) (*UIS* 2017, 2020). The high rate is due to an education program in which free schooling is provided up to grade 12. 96 percent of children are enrolled in primary school today. Higher education facilities on Fuvahmulah include two colleges, where students can obtain degrees up to a master’s degree. However, the subjects are limited, and therefore, students interested in other topics have to study in Male’ at the only university of the country, the Maldives National University, or abroad.

### **The Economic and Employment Situation**

Fuvahmulah’s labor force participation rate is the lowest of all atolls with 57 percent compared to the average of 63 percent of all administrative atolls (*NBS* 2015b, 11). Most employment in Fuvahmulah, according to the Census of 2014, is in education (17 percent), retail (14 percent), and manufacturing (13 percent) (*NBS* 2020a). Furthermore, tourism began to develop on Fuvahmulah in 2009 when it was permitted to have guesthouses on inhabited islands. Furthermore, the opening of the airport in 2012 has further allowed the development of tourism on the island by improving access to the island. Several guest houses are now open, and especially shark diving tourism has attracted a growing number of tourists to the island (*Fieldnotes*, 2/14/2019). Nevertheless, as on other islands of the Maldives, employment possibilities remain limited. The current situation is seen to be problematic for the youth, who have an especially high unemployment rate. There is a high degree of discontent in young adults because the main employment possibilities and higher salaries are mostly available in Male’ or in tourism-related

professions on resort islands away from their home islands, and often these positions are given to non-Maldivians. In consequence, it has been discussed that the discontent of the youth has led to a higher crime rate, which is associated with gang violence (*Borri 2017, Naaz 2012*).

### **Religion**

As all Maldivian citizens, all residents of Fuvahmulah are Muslim. The Maldives is one of the few countries in the world with a state religion, which makes it necessary for Maldivian citizens to be Muslim as required by the constitution. After the last Buddhist king of the country converted to Islam in 1153, Sunni Islam became the religion of the country (*Romero Frías 1999*). Islam has been described to provide the teleological component for the organization of the political system, as well as the social rules of the behavior. There is no secular system of law – the Sharia and its interpretations are the basis for the legal system of the country. For the Maldivians, Islam provides the systematized world view and defines the behavioral expectations that are seen as valid in society (*Maloney 2013*). Religion is seen as a strong bond among the Maldivian people, as it structures the lives of the people and important religious holidays, such as *Eid al-Fitr*, which bring families and neighbors together to celebrate.<sup>12</sup> For the following centuries after the conversion of the country, the practice of Islam has been described as rather lenient, which has been showcased in the practice of rituals that have rarely been exercised in a strict fashion but have been a mix of Islamic, South Asian, and Dhivehi influences (*Maloney 2013*). However, since the beginning of the 21<sup>st</sup> century and especially after the 2004 Indian Ocean Tsunami, *Wahhabism*, a conservative interpretation of Islam, has become increasingly influential. The spread of Wahhabism has caused tensions between supporters and those who interpret Islam in a moderate manner (*Robinson 2015*).

### **The Role of Women**

Furthermore, it has been argued that women's participation in politics and social life has fallen due to the spreading of the conservative religious ideology in society as well as the Islamic curriculum in schools (*Maldivian Democracy Network 2015*). Historical documents have shown that women governed the Maldives before the Islamization in the 12<sup>th</sup> century and that there has been “a remarkable record of women's participation in various aspects of nation-building.” (*UNESCO as cited in USAID 2015, 16*) Women in the Maldives were seen as one of the most emancipated women in Muslim countries and even in Asia (*ADB 2007*). A report of

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<sup>12</sup> *Maloney (2013)* has established that Islam does not meet the spiritual needs of the people. This is what the traditional magico-religious system, called *fandita*, offers to the people. *Fandita* has been of great importance for the perception of the world of the individuals as well as the psychological adjustments with the environment.

the *ADB* (2007) found that women are under-represented in the government on the national and local level and can therefore not participate sufficiently in decision-making. There is a widespread belief that the role of women is in the private sphere, which suggests that a stronger patriarchal system has developed in recent decades (*UNDP Maldives* 2011). Even though the education of women at the elementary level has reached good results, there is still a requirement to improve the post-secondary education of women. Furthermore, women are not able to fully participate in the labor force, which is demonstrated in the extremely low rates of women working in tourism, the largest revenue earning sector of the Maldivian economy (*USAID* 2015). The role of women in the Maldives is primarily seen as “wife, mother and chief caregiver” (*USAID* 2015, 22). This is especially the case because men are often away on other islands due to work-related activities, and other roles are seen as a subsidiary (*USAID* 2015). Although this interpretation of the women’s role is widespread throughout the Maldives, not all women fully accept this. The decentralization of the governance system of the Maldives is seen as an opportunity to increase the political participation of women (*UNDP Maldives* 2011).

The above-given outline of the analytical components provides the context for coastal governance in the Maldives and Fuvahmulah and allows to fully assess the degree of local adaptive capacity and understand the way factors enable and hinder a more local approach to coastal issues in the following chapters.

## 5 Assessing Local Adaptive Capacity of Fuvahmulah

After discussing the situation of the Maldives in the previous chapter, the following chapter delves into the multi-level coastal governance system in the Maldives with the aim of assessing the adaptive capacity of the actors and the affected community on the local level. The first step is the analysis of the decisive formal institutions. Formal institutions provide an understanding of how coastal issues are dealt with, including the allocation of responsibilities across levels and among actors. Afterward, the focus is placed on impact analysis of the governance variables on the local level's capacity to adapt that were introduced in chapter 2. Subsequently, the focus is shifted solely to Fuvahmulah's community. This section scrutinizes the relationships of community members with each other and the place they inhabit. In consideration of the overarching research question of the thesis, a special emphasis is put on how the sociopolitical context affects the local adaptive capacity.

The chapter commences with a brief historical outline of how coastal governance has developed in the country.

### 5.1 Historical Outline of Coastal Governance in the Maldives

Until the middle of the 20<sup>th</sup> century, coastal governance was predominantly shaped by spatial planning on the inhabited islands that aimed to regulate and minimize the influence of human activities and preserve the natural elements of the coastal zone that protected the islands against hazards. A central measure that illustrates this approach was the maintenance of the green belt, the *heylihi* (*NG01, NN01*). Houses and infrastructure were built in the island's center, behind the coastal vegetation, which aimed to protect the settlements from coastal flooding events. Nevertheless, coastal flooding events caused large-scale damage to the settlements on islands. A strategy to cope with severe coastal flooding and associated erosion issues was the resettlement of the affected community. Inhabitants of islands that were made uninhabitable after a disaster would resettle to non-damaged and undeveloped islands (*Naylor 2015*).

Increasing populations on the islands and associated expansion of infrastructure led to an increased need to safeguard and maintain the coasts. As a result, coastal protection structures were constructed. The first coastal protection structures in the Maldives were built in the 1970s (*Shaig 2011*). The "professionalization of coastal protection" (*NG01, 20*) commenced with two events, and the responses to these have shaped how coastal risks are addressed in the country (cf. part 4.1.1). Firstly, the flooding events in Male' in 1987 and 1988 and neighboring atolls have led to the construction of large-scale hard coastal protection measures around the capital

island and led to a formalization of coastal protection management (*NG01*, 17–24). Central parts of the country were hit by high tide waves that flooded half of Male'. The flooding caused damage of almost USD 6 million and led to an outbreak of cholera in the capital (*JICA* 1998, 2). As a result, a seawall on the island's eastern coast with a length of about 1.5 km was built with a financial grant from Japan International Cooperation Agency. The purpose of the project was to prevent the submergence of the east coast of Male' and to secure stable living conditions as well as economic and administrative activities in Male' (*JICA* 1998, 1–2). The flooding of Male' was termed a “wake-up call” for the need for coastal protection structures in an interview with a high representative of the MEE and a step away from the traditional approaches to coastal protection that focused on the maintenance and protection of the natural coastal protection elements (*NN01*, 17). The whole coast of Male' has since been fortified through the construction of revetments and seawalls over the past two decades. Secondly, another event that had a long-lasting influence on the approach to addressing coastal hazards on the national level as well as on the local level was the 2004 Indian Ocean tsunami. While the tsunami caused havoc on numerous other neighboring islands, Male' was hardly affected by it (Fig. 19). This fact has been interpreted by government officials and the population as evidence that the hard coastal protection measures implemented in the capital were effective (*NN04*, *LG03*).

These two events have influenced the coastal protection strategy, which is indicated by data on preferred constructed coastal protection. The Government of the Maldives (GoM) has pursued



**Fig. 19: Monument in Male' commemorating the victims of the 2004 Tsunami (own photo, 2017)**

the strategy to protect the inhabited islands with hard coastal protection measures (*NN01*). According to government documents, most of the USD 38.7 million that the Government of the Maldives has spent on coastal protection measures were spent on traditional engineered measures (*MEE* 2017, 2016). USD 8.6 million were allocated to coastal protection measures alone for the year 2018 (*MEE* 2017).

The next part delineates the laws, regulations, and allocation of responsibilities.

## **5.2 The Formal Institutions**

In the following, an analysis of the legal framework is given, including the legislation, regulations, and guidance documents. Secondly, the allocation of responsibilities to the actors on the multiple levels of the governance system is provided.

### **5.2.1 The Legal and Regulatory Framework**

Regulations and policy papers provide the foundation for the way coastal issues are approached and define the responsibilities of the involved actors. The following part presents the documents that are relevant to coastal governance.<sup>13</sup>

The legal framework in regard to coastal governance and adaptation was found to be rudimentary. There were limited specifications in laws and regulations directing the planning and implementation of coastal protection measures in the country. The most important law regarding coastal protection is the *Environment Protection and Preservation Act (Law no. 4/1993)*. It dictates regulations for all development activities that potentially have an impact on the environment. It is the main reference framework for national policies on the environment and is especially significant for environmental impact assessments and protected area management. The *Regulation on the Preparation of Environmental Impact Assessment Report 2012* is derived from the *Environment Protection and Preservation Act*, which is significant for environmental protection in the Maldives (*Ministry of Housing and Environment* 2012). The regulation demands an analysis of the environmental and societal impacts, which include the consultation of affected groups of all infrastructural and developmental projects. The result of the assessment either allows the project to be implemented or prohibits the implementation if the impact is assessed as excessively intrusive. It furthermore determines which proposals require an environmental impact assessment study. In regard to coastal structures, the list includes “sea defence

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<sup>13</sup> For an in-depth look into the laws and regulations that are relevant for the implementation of a coastal protection measure, see the environmental impact assessment report for the coastal protection measure on Fuvahmulah by *MEECO* (2016).

structures (such as seawalls, revetments, marine installation, offshore breakwaters, groins), land reclamation projects, beach nourishment, artificial reefs” (*Ministry of Housing and Environment* 2012, 24). The *Environmental Impact Assessment (EIA) Regulations* furthermore demand a consultation with a multitude of actors and especially stresses the need to cooperate with the lower-level government as well as the affected community. Further regulations that provide regulatory stipulations for coastal governance, but are less important for the assessment of local-level adaptive capacity and are therefore only enumerated in the following, are the *Regulation on Dredging and Reclamation (2013/R-15)*, the *Regulation on Sand and Aggregate Mining (2000)*, and the *Regulation on Uprooting, Cutting and Relocating Trees and Plants from one Island to Another (MEECO 2016)*.

### **Guidance Documents**

While laws and regulations lacked clear provisions, various guidance documents addressing the actors on the local, national, and international levels regarding coastal issues have been published that aimed to further the formalization of addressing coastal issues. A document that targeted establishing a more organized setting for coastal protection measures was the *Survey of Climate Change Adaptation Measures in the Maldives*, published by the MEE in 2011 (*Shaig* 2011). A survey of adaptation measures was done on 40 islands, including inhabited as well as resort islands, and was meant to identify the multitude of coastal protection measures that have been implemented. This document is especially noteworthy as it highlighted soft coastal protection measures next to the conventional hard measures. Another aim of the survey was to identify positive and negative examples that could guide the planning and implementation of future projects. A second guidance document focusing on addressing coastal challenges is the *Guidance Manual for Climate Risk*, published by the MEE in 2015 (*MEE* 2015a). It is a government document that attempts to mainstream coastal protection knowledge in the country. This guideline is designed to act as a map that offers “standards and protocols for selection, design, implementation, and maintenance of the appropriate coastal protection measures” for local-level actors and the affected communities (*MEE* 2016, 93). By providing island actors with a step-by-step guide on how to choose and plan coastal protection measures, it constitutes an attempt to strengthen the role of lower-level actors in coastal governance. An important strategy by the national government that looks into how the country could be capable of dealing with the expected climate change impacts and especially those caused by the rising sea level, which is presumed to lead to the uninhabitability of a number of islands by the national government, is the *Safer Islands Strategy (MEEW 2007, 47)*. The plan prominently includes the resettlement of populations of smaller, more vulnerable islands to eight to ten of the larger

islands that are able to function as a safe haven. These safe islands will be particularly protected by coastal protection measures (MEEW 2007). The first example of a *Safer Island* is Hulhumale', an artificial island that has been created adjacent to the capital Male'. The island was purposely raised higher than the natural islands of the country with sea-level rise in mind, and its elevation lies at about 1.8 m above mean sea level (Brown et al. 2020).

Coastal governance in the Maldives is strongly related to climate change adaptation discussions, which becomes apparent in the way sea-level rise is addressed in the documents aimed at the international climate change arena (Malatesta and Di Schmidt Friedberg 2017, Hirsch 2015). The Maldives have ratified the *Kyoto Protocol* and are party to the UNFCCC. In accordance with these international treaties, the country has submitted a *National Adaptation Programme of Action (NAPA)* in 2007 (MEEW 2007) as well as two *National Communications* (MEE 2016, Ministry of Home Affairs, Housing and Environment 2001). An overarching theme in these documents is that the Government of the Maldives expresses the urgent need for coastal adaptation measures that are generally attributed to climate change impacts. Furthermore, the documents stress insufficient human, institutional and financial capacity that act as a barrier to successful adaptation. Another important document and part of the *Hyogo Framework for Action 2005–2015* is the *Strategic National Action Plan for Disaster Risk Reduction and Climate Change Adaptation 2010–2020 (SNAP)* that emphasized that climate change was a significant objective of the Maldivian government during the Nasheed Presidency (*The Republic of the Maldives* 2010). In this document, the focus on presenting the country as vulnerable on the international level was prominent. On another note, the action plan highlighted the administration's aim of empowering and building resilience at the local level. Four strategic areas were specified: "1. establish an enabling environment towards good governance; 2. empowered and capable communities; 3. resilient communities with access to technology, knowledge and other resources; 4. risk-sensitive regional and local development" (*The Republic of the Maldives* 2010, 11). The strong connection between climate change and coastal issues was furthermore stressed in the *Climate Change Policy Framework* in 2016. In regard to the local level, the latter framework stressed the aim to empower the local level governments as well as the local populations in order to increase the resilience on this level (MEE 2015b).

### 5.2.2 The Actors and other Groups in Coastal Governance and their Roles<sup>14</sup>

Aiming to assess the local adaptive capacity, there is a need to identify the numerous actors and groups that participate in coastal governance in the Maldives (Fig. 20). This part reviews their responsibilities according to the formal institutions. To begin with, the actors on the national level are introduced, followed by the actors and the community on the local level.

Due to the incomprehensive formal framework, a blueprint that elucidates the responsibilities and roles of actors and groups in coastal governance has not been fully developed in the Maldives. Nevertheless, a number of influential organizations and groups in the context of coastal governance, which is closely related to environmental governance in the Maldives, were identified. These are mostly located on two levels, the national and the local level. The Local Government Authority has a special role as it acts as an intermediary between the actors on the two levels.

#### The National Level

There are multiple departments of different ministries involved in coastal governance. The following part gives an overview of the identified distribution of tasks among the ministries and other actors on the national level.

##### *Government Actors on the National Level*

The highest administrative tasks are conducted by government ministries in the capital Male'. After years of unclear allocation of responsibilities, the MEE has formally become the main government body responsible for policy making regarding coastal development issues. Within the ministry, the obligations in the coastal context are distributed among the departments *Environment* and *Climate Change*. In the enumeration of the *Climate Change* department's tasks, it is stated that the department is responsible for "bolstering adaptation actions and opportunities, building climate-resilient infrastructures (including coastal protection) and communities" (*Ministry of Environment 2020*, para. 3). The ministry has the mandate to write regulations, policies, and standards for coastal projects that aim to stop coastal degradation. Furthermore, it has the responsibility to seek the funds for projects from the state budget as well as from donors (*MEECO 2016*). On the international stage, the Maldivian national government has put a lot of effort in attempting to acquire funds from foreign donors and international non-government

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<sup>14</sup> The analysis is limited to actors that were identified to be relevant for the case of Fuvahmulah, which has the status of a city. The administrative structure for inhabited islands with island status is different. In these cases, the atoll council is another actor that would need to be considered in the analysis.

organizations for climate change adaptation by showing their presence in the international climate change debate. This includes their participation at numerous conferences on climate change, first and foremost at the Conferences of the Parties to the UNFCCC, or its membership in various groups such as the Alliance of Small Island States (*NG03*). Especially funds from the Global Environment Facility (GEF) are seen as important (*NG01*). Nevertheless, as discussed in part 4.2.2, the focus on the international level has decreased after Yameen was sworn in as president.

A second important government body is the Environmental Protection Agency (EPA), which is an operational agency of the MEE that acts in semi-autonomously ways. Importantly, the EPA enforces the *EIA Regulations*. The EPA is the responsible authority to collect and assess the severity of erosion problems on affected islands, i.e., to understand the changes and the causes of the coastal erosion and to develop ideas to solve the problems (*MEECO 2016*). On the basis of this data, the EPA drafts a proposal regarding which islands should receive a protection measure for the parliament, the cabinet, and the President's Office, who then decide which islands will receive a coastal protection measure (*NG02*). The EPA's mandate includes close cooperation with the local level government (e.g., atoll, city, and ward councils), the affected community, and other actors to reach an agreement on how to approach a coastal erosion issue, including what coastal protection measures are preferred by the various actors (*NG02*). Further tasks of the EPA include collecting aerial images and satellite imagery to record changes to the formation of the country's islands, as well as collecting, obtaining, and disseminating data for geographical information systems (*MEECO 2016*).

While the MEE is the leading ministry in the coastal governance structure, the Ministry of Housing and Infrastructure (MHI) is also allocated with responsibilities. The MHI is responsible for planning, implementing, and managing coastal protection measures that are part of dredging or land reclamation activities for harbor infrastructures (*MEECO 2016*). Furthermore, they are responsible for the management of the reconstruction of public infrastructure that was damaged by a natural disaster or other influences. Other tasks include the maintenance of an information database on the condition of public coastal infrastructure.

Other government actors that were identified were the cabinet as well as the People's Majlis, the Maldivian parliament. These actors, first and foremost, played a role in the allocation of funds for addressing coastal issues. More importantly, due to the high level of centralism and the strong role of the president in the governance system, the President's Office was found to

have a large degree of influence on the decisions regarding the allotment of coastal protection measures to islands (NG01).

The establishment of a new government body, the Local Government Authority (LGA), was an attempt to improve the coordination of cooperation between the national and local levels accompanying the decentralization process (CLGF 2015). Nevertheless, the LGA was not identified to have any significant responsibilities in the analysis of coastal governance and did not influence the adaptive capacity on the local level in this case study.

#### *Non-government Actors on the National Level*

As an intergovernmental organization, the United Nations Development Programme (UNDP) Maldives demonstrated to be an influential organization in coastal governance in the Maldives. The UNDP Maldives has taken a leading role in cases where it comes to promoting alternative approaches to addressing coastal problems and climate change adaptation, as they demonstrated in a number of programs, including the *Integrating Climate Change Risk to Resilient Island Planning (ICCR)* or the *Enhance National Capacity for Disaster Risk Reduction and Management in Maldives* projects. The UNDP Maldives importantly promotes the provision of training and grant funds, as well as consulting capacities.

Environmental consultants are another important group on the national level that is primarily based in Male'. The consultants are involved in the design, planning, and implementation of coastal protection projects and have a strong influence on coastal governance as they have a high degree of knowledge in the field, which is deficient in the relevant ministries. Furthermore, they are responsible for conducting environmental impact assessments.

In general, there is only little activity from civil society groups in the Maldives, in general, as well as for activities in the context of coastal issues and environmental protection activities. As protecting the coast on coral islands is closely related to aspects of environmental protection, it is impossible to distinguish between the two (NN01). About a dozen NGOs are active in the Maldives that are working on environmental and coastal topics; the most prominent organizations include: Bluepeace, ECO CARE Maldives, and Save the Beach (NG01). NGOs in the Maldives prefer to remain in smaller groups, generally consisting of friends and colleagues (NG02, LN04).

### **The Local Level Actors and the Affected Community**

In regard to local level actors involved in coastal governance, the actor groups in Fuvahmulah were made up of the city council, NGOs, and community groups. Furthermore, members of the community were investigated.

#### *Government Actors on the Local Level*

The lower-level government on Fuvahmulah is made up of the city council and ward councils. The city council on Fuvahmulah consists of political and administrative staff. Since the *Decentralization Act* has been implemented, the responsibilities assigned to the city council related to addressing coastal issues have formally increased. These include tasks such as reporting coastal erosion to the national government as well as maintaining and repairing sea walls and breakwaters (NG03). Furthermore, the city council is responsible for the maintenance of ports and jetties. The city council is dependent on financial transfers from the national government. Ward councils were not found to have any mentionable role in coastal governance on Fuvahmulah.

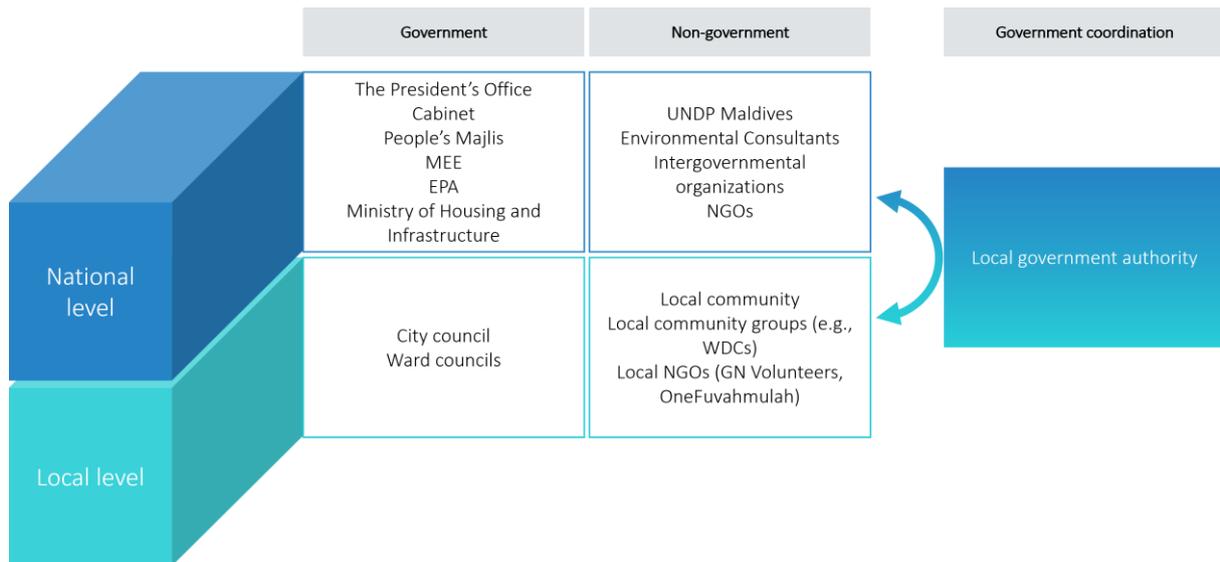
#### *Other Actors and the Affected Community on the Local Level*

In Fuvahmulah, there are two NGOs that focus on environmental work, which conduct activities in the coastal context: GN Volunteers and OneFuvahmulah. GN Volunteers has a pool of approximately 60 members that pay membership fees and about 100 volunteers. In general, they perform activities in three fields: disaster management, health, and youth empowerment (LN04). The second NGO, OneFuvahmulah, has a lower number of members, approximately a dozen, and is focused more strongly on awareness-raising for environmental issues, such as coastal erosion and waste problems.

Women's Development Committees (WDCs) advise the city council regarding development activities and regularly perform activities. The role of the WDCs has been strengthened through the *Decentralization Act* and is a legal entity with a mandate to implement community activities that are facilitated by the council (USAID 2015). While the responsibilities of the WDC are described as primarily to be focused on strengthening the role of women, on Fuvahmulah, the WDC often organized beach cleanups.

Overall, the local community's role in coastal governance has been strengthened by laws and regulations, as shown in the *Decentralization Act of 2010*, as well as the *EIA Regulations*. However, the skills, knowledge, and interests vary strongly within the community, which is analyzed more closely in part 5.3.

## Assessing Local Adaptive Capacity of Fuvahmulah



**Fig. 20: Actors and other groups of the coastal governance structure in the Maldives (own illustration)**

In conclusion, it was shown that there is a low degree of formalization in coastal governance in the Maldives. As demonstrated, there are only a small number of laws and regulations and a vague allocation of responsibilities among the involved actors. The responsibility allocation among the powerful actors in the governance system, the ministries as well as the role of the President's Office, was shown to remain unclear. Nevertheless, there have been attempts to increase the degree of formalization. It was furthermore demonstrated that formal institutions dictate that local-level actors and the affected community need to be integrated into the decision-making processes.

A closer examination of the roles and responsibilities of the actors and the local community and the distribution of powers across the levels in the practice of coastal governance, as well as the relationships and interactions, are revealed and discussed in the following chapters.

### 5.3 The Governance Variables

The following part analyzes variables of the multi-level governance system of coastal governance in the Maldives. This investigation allows determining in how far a more local approach to addressing coastal issues, i.e., stronger consideration of local-level actors and the community and coastal protection measures that can be implemented on the local level, can be considered. A focus is on identifying the formal and informal institutions of coastal governance based on the five governance variables – (1) Experience with coastal issues and addressing these; (2) Risk and problem perception; (3) Comprehension of responsibilities for action and policy preferences; (4) Collaboration and power distribution; (5) Availability and sharing of knowledge and information – that were introduced in detail in chapter 2. For each variable, the findings for the different levels, the national level as well as the local level, are presented. The part on the

national level discusses the findings regarding the national government as well as non-government actors on the national level. On the local level, it furthermore is differentiated between the local level government and the community as well as other non-government organizations (Fig. 21). Each variable closes with a summary of the degree of the capacity to adapt, which is based on the assumptions of how the variables affect adaptive capacity in chapter 2. On top of this, when of importance, influences of the international level are included in the investigation.

The following part is based on the statements and opinions of the population survey participants and the interview partners of the semi-structured interviews of both field trips. Statements of the former are underlined with the term *participants* or *respondents* and the latter with *interviewees* (for the codes of the interview partners, see Fig. 8 and Annex I).<sup>15</sup>

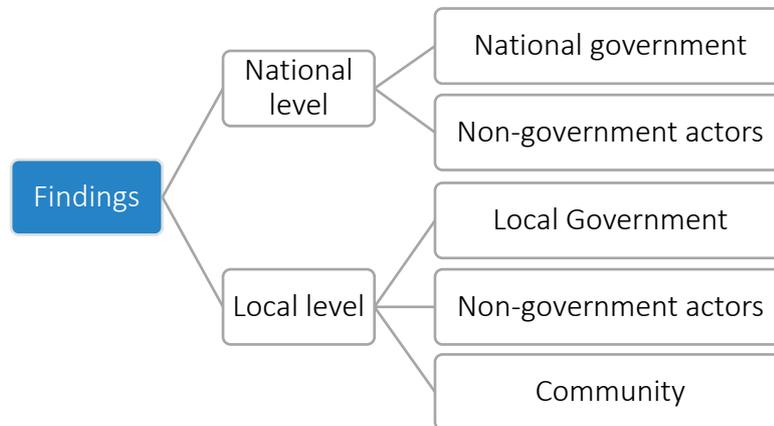


Fig. 21: Analysis steps (own illustration)

### 5.3.1 Experience with Coastal Issues and Addressing the Issues in the Maldives

The analysis is guided by the assumption that the risk experiences on the national as well as on the local level affect the local adaptive capacity by indicating how urgent the issue is perceived to be by the different actors. Furthermore, the experience with addressing the coastal issues demonstrates the amount of knowledge and willingness of members of the affected community to become active in regard to the risks. Activities by community members can take different forms, including providing local environmental knowledge to responsible government authorities and developers that increase the likeliness of appropriate designs for coastal projects to more sustainable behavior, which can decrease the stress on coastal ecosystems.

The experience that the actors have gathered regarding coastal erosion and associated coastal risks and the way they have responded to them demonstrate how the actors dealt with these

<sup>15</sup> Survey participants of the 2017 population survey are referred to by: *SI 001*, *SI 002*, and so forth. The survey participants of the 2019 population survey are referred to by *SII 001*, *SII 002*, and so forth.

risks in the past and what they might have learned from these events and indicate their preparedness for current and future stresses.

### **Experience with Coastal Issues on Fuvahmulah**

Focusing on how erosion and associated risks have been observed and assessed on Fuvahmulah by the actors of the various levels, numerous aspects signify that all levels have noticed the coastal erosion issue on Fuvahmulah and considered it an urgent problem. On the national level, the coastal erosion issue on Fuvahmulah was assessed as so severe that the protection of the island's coast was considered a priority by the MEE (*MEECO* 2016). Furthermore, the last three presidents have visited the site of the coastal erosion on Fuvahmulah and declared their intention to build a coastal protection structure.<sup>16</sup> The current president, Mohamed Solih, included the planned coastal protection measure in Fuvahmulah as a campaign pledge for the agenda of his first 90 days in office (*Maldives Independent* 2019c). The approach of the national government to deal with the coastal erosion issue on Fuvahmulah is to construct a large-scale revetment of 4.4 km in length. The coastal structure will approximately cost USD 25.5 million and will be constructed in cooperation with a Dutch engineering company and financial support from Kuwait Fund for Arab Economic Development, ORIO, and the Netherlands Enterprise Agency (*MEE* 2017). This plan resembles the standard procedure to address coastal erosion issues and other coastal hazards in the country: a focus on hard coastal protection measures implemented in a top-down manner – discussed in more detail in part 5.3.2. The top-down manner of implementation furthermore becomes apparent as there is little experience of the national government in implementing coastal protection measures actors with the support of affected populations on the local level, according to interviews. Interviewees reported that the government authorities had gained only limited experience in including the affected populations in the decision-making processes or by involving them stronger in the implementation or maintenance phase of coastal protection measures (*NN02*, *NN03*).

On the local level, the city council was highly concerned with the erosion problem on Fuvahmulah and assessed a response as urgent. A coastal protection measure that is planned and implemented by the national government was seen to be the only conceivable solution by the city councilors (*LG01*). The councilors have been attempting to exert pressure on the national government to commence constructing a coastal protection structure that has been promised for several years (*LG02*). In the past, the council, in cooperation with the population on Fuvahmulah, has demonstrated to respond to coastal erosion issues autonomously without depending on

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<sup>16</sup> Not including Mohamed Waheed, the interim president during the transition from Nasheed and Yameen

the support of the national government. For example, the councils and community members built small-scale breakwaters and sea walls in response to coastal erosion processes in spatial proximity to the access channels (*LN02, LG03*) (Fig. 22).



**Fig. 22: Small-scale sea wall on Fuvahmulah's east coast (own photo, 2019)**

On the community level, coastal issues on Fuvahmulah have also become an urgent problem for the community members, as results from the population surveys have revealed. The following part illustrates how the people on Fuvahmulah have observed erosion, how they assessed the associated risks it entails, and how they have reacted to it in the past. A group of questions sought to identify how far the island's population has experienced coastal issues and if they assessed these as urgent compared to other societal and environmental issues. To achieve this, it was first necessary to understand to what extent environmental problems are considered important for the island's population and which environmental problems the inhabitants considered to be most crucial. A closed question of this group intended to explore what societal problems on the island are seen to be the most pressing. "Environmental problems" are perceived as the second most acute problem for Fuvahmulah, with about every fifth interviewee (19 percent of 342 mentions) considering these as one of the three most pressing issues from a given list. Only "drug use" (24 percent) was named more often, and "unemployment" (18 percent) was seen as a similarly pressing problem. In a follow-up question, the focus was shifted towards environmental questions. The participants were asked if they have observed any changes regarding the environment of Fuvahmulah in the past and if they have observed a change to specify it. Responses were unambiguous, with a large majority having perceived a change (93 percent of the respondents). The specifications were dominated by "erosion" (32 percent of 218

mentions), with numerous respondents going more into detail and specifically describing the erosion on the east coast as a problem. One respondent reported a changing island environment as a result of the erosion process:

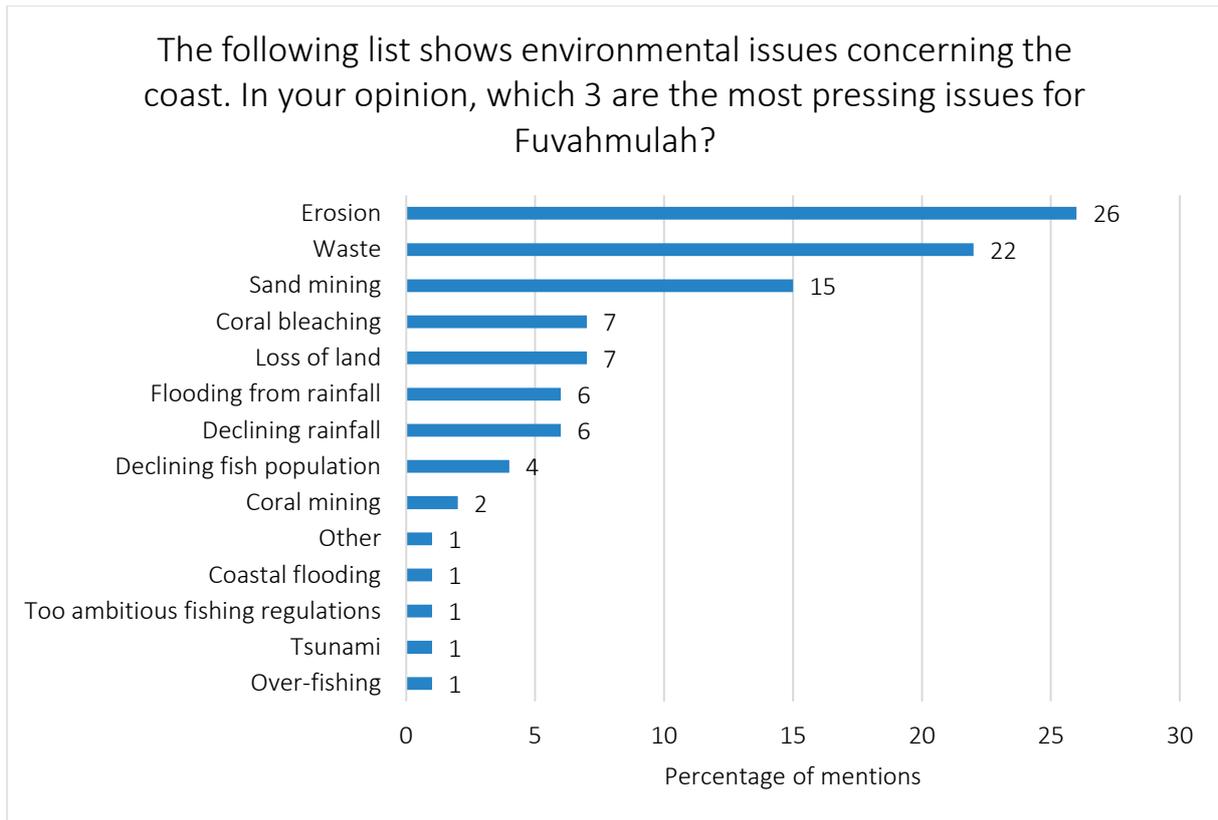
“Coastal erosion is one of the major issues. It’s caused by the huge waves. It’s been going on for a long time. I had a good conversation with an old guy in Maalegan [Ward of Fuvahmulah]. He told me that he doesn’t remember that the beach has been this small. He said that when he was young that the beach was really far spread out, and there were a lot of boats on the beach. And now, there is nothing. Even on the east side, he said that there was a sandy beach. Now you will not see any sand. There are just a few areas with very little sand. But there used to be a big sandy beach. Even in Maalegan, you can see, there is a children’s park, I still remember that in that area, there was a big, huge beach. (...) But now, there is nothing, only stones.“ (SII 01, 16)

With the aim of attaining more insights on the participants’ perception of coastal issues, a follow-up question gave the interviewees a list of environmental issues concerning the coast in Fuvahmulah, to which the respondents were asked to name the three most pressing from their point of view. More than three out of four respondents stated that “erosion” is one of the three most pressing issues in Fuvahmulah (26 percent of 354 mentions), with “waste” (22 percent) and “sand mining” (15 percent) trailing behind (Fig. 23).

Some interviewees discussed the effects of erosion and how it has affected living on Fuvahmulah (Fig. 24):

“The beach near my house, there used to be a shipyard where we could keep our fishing vessels. But now it's gone.” (SI 085, 12)

## Assessing Local Adaptive Capacity of Fuvahmulah



**Fig. 23: Most pressing coastal issues (N=116, no. of responses=354, structured question, max. three responses per respondent)**

Another question asking if the respondents have observed coastal erosion revealed that 94 percent of the respondents had noticed the process, and only 6 percent have responded with either “no” or “don’t know”. Coastal flooding, on the other hand, has been observed only by 34 percent compared to 66 percent that has not observed it, indicating to be a less pressing issue for the respondents. The following question confirmed that coastal flooding had not been perceived as a pressing issue for the respondents. Asked if the respondents have acted in any way to protect themselves or their property from coastal flooding in a closed question, a clear majority of the interviewees negated the question (82 percent of the respondents). Less than one of five interviewed stated that they have become active against coastal flooding. Interestingly, some respondents gave reasons why they do not perform any activities and stated that coastal flooding is not an urgent issue.



**Fig. 24: Eroded coast and exposed roots of a palm tree on Fuvahmulah's east coast (own photo, 2019)**

This can be explained by the limited damage to properties and infrastructure through coastal flooding, even though it is a recurring event on Fuvahmulah (Tab. 1). Nevertheless, a flooding event in mid-2013 caused some damage to residential buildings and plantations on the island's east coast. Farmers in the north and northeast of the island regularly report of damages, as the groundwater wells they use to water their plants become salinized by the floodwater (*SII 080*). Heavy flooding in western parts of the island was caused by storm surges in April 2018, causing some flooding damage to houses and the main road. In response, community members, the council, and local construction companies cooperated on the repairing of the main street around the island (*Personal communication, 4/30/2018*). Community members reported that houses, properties, and a playground were at the highest risk of being damaged by erosion and flooding, and most coconut palm trees being washed into the sea were located on the east coast (*SI 031, SII 001*). While both coastal erosion processes and coastal flooding events on Fuvahmulah have been spatially concentrated on the east coast, no differences in the risk perception of the people living in different parts of the island became apparent in the survey. This indicates that the people of Fuvahmulah feel affected by the coastal issues to a comparable extent.

## Assessing Local Adaptive Capacity of Fuvahmulah

In this part, it was shown that coastal erosion has been widely experienced by the people on Fuvahmulah and was assessed to be a serious problem, showing that the issue was identified as a problem, which is a prerequisite for adaptive capacity. The following part investigates how far community members have been involved in activities focusing on addressing coastal issues and have gathered experience in addressing coastal issues.

### *Community Activities that Address Coastal Issues on Fuvahmulah*

The following part investigates in how far community members have shown to respond to environmental problems regarding the coast, either through behavioral changes or by taking part in activities associated with protecting the coast. Both responses reflect how far there is a willingness to act on coastal problems and demonstrate how far community members are willing to work together on the one hand and with other actors of the governance system on the other hand. These activities can be assessed as a response of the actors to past experiences and to changes in their environment. Instances of past participation can be further interpreted as experiences of the people regarding stressors as well as gaining knowledge regarding coastal ecosystem services and are therefore relevant for future adaptation activities, and thus for local adaptive capacity.

More than three out of four respondents have participated in an environmental protection activity related to protecting the coastal zone (78 percent). Of these, most respondents (72 percent) participated in activities that were organized by an island-based organization, such as the ward or city councils, by schools, by a local NGO, or it was an activity organized by their employers, such as the police department or the local waste collection company. The rest (28 percent) reported that they conducted environmental protection activities on their own, for example, by integrating it into their daily rituals, as the following respondent reported:

“I already told my kids, whenever we go to the beach every day, we have to pick up five plastics or things that are falling to the environment, and we are already practicing that.” (SII 034, 10)

People’s motivation to get involved in protection measures concerning the coast varied: The main motivation to many of the interviewees was the feeling that Fuvahmulah is vulnerable (20 mentions) and that there is a need to protect it in order to:

“(…) preserve the environment and the land. Because we need to preserve it for our next generation and our resources.” (SII 015, 14)

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Respondents were articulating the fear that the erosion processes are possibly endangering their future and the future of the next generation on Fuvahmulah:

“I do this because it’s not really good when you see garbage on the beach. And the coastal area is going away. There are some houses very near to the beach, they are at risk, right, when they might get washed away.” (*SII 001*, 10)

According to the respondents, the perception of the erosion problem and the associated risks has increased the willingness of respondents to get involved in activities to protect the coastal zone of the island (in more detail in part 5.3.3). Others spoke about their interest in having clean beaches (7 percent) or saw it as a duty that allows them to be part of the community (6 percent). A number of respondents stated to deliberately instrumentalize their activities to demonstrate that there is a demand that coastal issues are better dealt with towards the authorities, as shown by the following interviewee:

“By conducting more beach cleaning activities, people would be more engaged, and the politicians here would understand that people are interested in preserving the coast more.” (*SII 069*, 19)

By getting active in environmental protection activities, the respondents demonstrated to the politicians that the environment, particularly the coastal zone is something of worth to the island’s population and needs more protection than currently implemented by the responsible authorities. Others argued that they take part in beach cleaning activities for aesthetical reasons or because they feel they are obligated because they are part of the community. Interestingly, especially some older men reported that they plant coconut palm trees on the coast on their own to intentionally stabilize the coastal areas and to counteract the erosion processes they have observed in the past years (*SII 001*, *SII 072*). By performing this activity and arguing in this direction, they demonstrated their knowledge about the environment and the protective functions of the *heylihi*. Another group protruded with specific knowledge: Respondents that have worked in resorts demonstrated to have gained knowledge about the value and importance of the functions of coastal ecosystems for the protection of the coast. The former employees of resorts have shown that they are willing to implement their new knowledge on their home island and share their information with other community members. An example of an innovative idea for addressing coastal problems that was propagated by one respondent is coral gardening (*SII 038*). Others spoke of their knowledge of the importance of the coral reefs and the *heylihi*. One interviewee argued: “The first line of defense is the reef and the beach. If we lose both, we are defenseless.” (*SI 033*, 10) In general, however, respondents stated that they have doubts about

how far their activities are able to combat the erosion problems due to the severity of the erosion issue.

Those who have not participated in an environmental protection activity named time constraints, lacking invitations to such activities, lacking knowledge of activities taking place, and lacking interest, among others. Other constraining factors are related to trust issues as well as lacking community cohesion. These factors are discussed in more detail in part 5.4.1.

However, in contrast to the before-given account of the statements of the survey respondents, NGO representatives stated that community members on Fuvahmulah show limited interest in engaging in NGO activities in general and especially in environmental projects. Furthermore, they argued that Maldivians are not keen on being members of clubs or organizations.<sup>17</sup> On a different note, however, representatives of NGOs argued that especially young people are interested in joining and are the most interested in environmental topics (*LN04*).

A further question of the questionnaire focused on the opinion of the respondents on how a wider community involvement could be achieved on Fuvahmulah that would entail higher adaptive capacity. In general, community members argued that the most important aspect of getting more people involved in environmental protection activities is that authorities raise awareness about the problems and give information on how to act more environmentally friendly (27 percent of 117 mentions). Furthermore, the community members believed that more people would get involved if more activities were conducted and if more people would be invited to measures (16 percent). Some elderly criticized that they have not received invitations to the activities because they do not use the social media platforms via which the activities are generally organized and invited to. Hence, they called for a better effort to invite wider groups of people to the activities, using communication channels they use as well (*SII 053*). Others stressed the important role of authorities and politicians. On the one hand, various respondents (9 percent) stressed the role model character of politicians in the Maldivian society, which should be utilized to get more people involved in environmental activities:

“Politicians, each and every one, they have a huge following, right? So, in the campaign events or in other political gatherings, if they talk about those things, I think there will be people who believe them. There are many people who are

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<sup>17</sup> This is true for the Maldives in general according to representatives of NGOs from other islands, as well as from other organizations, such as the UNDP Maldives or researchers (*LN05, NN05, NN04*).

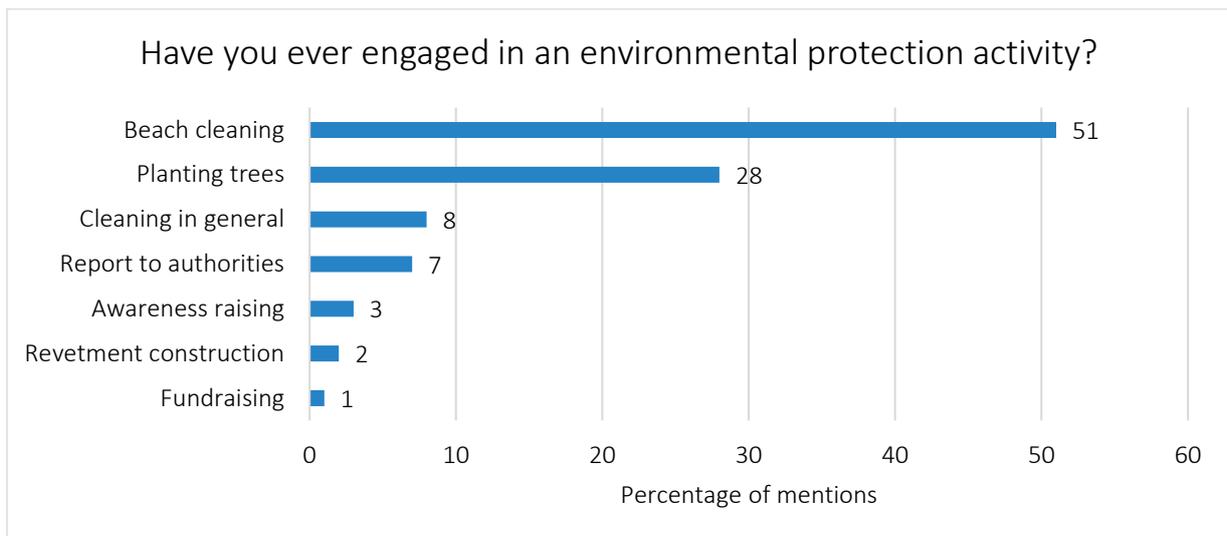
blindly following them. If they talk about those things, I'm sure there is going to be a change, there will be a change.” (SII 020, 87)

On the other hand, they believed that it is important for politicians to act more for the community than for themselves or their parties:

“Politicians are dirty. First, they have to become clean. And you know, involve people in what they do and show the reality of what they are really doing in the Majlis. Then only people will believe in them.” (SII 048, 67)

### Types of Local Activities on Fuvahmulah

The survey revealed that most environmental protection activities were related to the coastal zone. The activity that most respondents have participated in was beach cleaning (51 percent of 88 mentions), followed by planting trees (28 percent) and reporting illegal activities to authorities (7 percent) (Fig. 25). Numerous respondents reported other cleaning activities (8 percent). The following section gives more in-detail information on the first-named activities.



**Fig. 25: Participation in environmental protection activities (n=66, no. of mentions=88, open question, multiple mentions possible, categorized)**

#### *Beach Cleaning*

Half of the respondents (51 percent) that have participated in activities have taken part in a beach cleaning activity (Fig. 26). While most respondents spoke of aesthetical reasons when asked for their motivation to participate in beach cleaning activities, some interviewees explicitly associated the waste problem with the issue of erosion and interpreted their participation in cleaning the beach as an activity to counteract erosion. Most respondents reported that they have participated in organized beach cleaning events, most often organized by the city or local-based NGOs. Various interviewees reported that they have participated in beach cleaning events

organized by schools to which the parents of the participating students were invited. Another group of respondents reported that they regularly pick up trash on their own when going to the beach.



Fig. 26: Beach cleaning activity in South Male' Atoll (own photo, 2019)

According to survey respondents that were active in women's development committees in Fuvahmulah in the past, the maintenance and cleaning of the beaches was a central responsibility of these committees. The respondents reported that they welcomed non-committee community members to their activities which raised awareness for environmentally conscious behavior (*SII 035*). However, the recent undermining of the role of the women's committees by government actions weakened the traditionally strong community group on Fuvahmulah and shifted the undertaking of the activity to other organizations, such as NGOs, that needed time to develop from taking on the activities (*NN03*). According to respondents, the committees were in the process of reorganization and reported increasing support by the city council on Fuvahmulah (*SII 063*).

A representative of an NGO that regularly organizes beach cleaning events stated that it is an effective means to raise awareness about the importance of ecosystem services within the local island populations. In his opinion, Maldivians are interested in cleaning activities on the beaches as they spend a lot of their leisure time on the beach and are fond of clean recreational areas. The NGO takes advantage of this openness and teaches the participants about the coastal protection services (*NN07*). On a rather critical note, he noted that coastal cleanup activities had become a *greenwashing* activity for commercial companies in the Maldives. The employers

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compel their employees to participate in beach cleaning activities with the aim of posting a photograph of the collected trash on social media accounts – without the aim of learning from the activity (NN07).

### *Planting of Coastal Vegetation*

28 percent of those that have participated in an activity have reported having planted coastal vegetation. The planting of coastal vegetation on Fuvahmulah has been organized by the city and ward councils, the women’s council, and local NGOs. The planted vegetation included plant types domestic to Fuvahmulah, including coconut palm trees and shrubs (Fig. 27). The local NGO OneFuvahmulah has started to approach the activity with an innovative method by experimenting with the planting of coastal vegetation that is not natively found on Fuvahmulah with the hope of more effective outcomes. This alternative shrub is only found on the northern islands of the Maldives, where it has proven to stabilize the shoreline effectively (*Fieldnotes* 2/28/2019). This activity is an example of how individuals and groups on the local level experiment and utilize alternative approaches.



**Fig. 27: Planted palm trees on Fuvahmulah’s coast (own photo, 2019)**

### *Construction and Maintenance of Coastal Protection Structures*

The five before-mentioned small-scale coastal protection structures around the coast of Fuvahmulah have been constructed and are maintained by the council with the support of community members. According to an interviewee, the local and small-scale coastal protection elements, including revetments and offshore breakwaters, were constructed without the expertise of actors of the national level. The construction was a response to the erosion of the coast in the

areas of the dredged channels. In particular, older men have reported that they participated in constructing coastal protection measures (*SII 027, SII 042*).

### *Coral and Sand Mining*

The examples of the mining of coral stone and sand provide an understanding of how the community members changed their behavior in response to coastal problems and to directives from the national government. To get a better understanding of this issue, some background information is presented. Coral stone is the only naturally occurring construction material in the Maldives. For this reason, almost all buildings on the Maldivian islands were primarily built with coral blocks since the 19<sup>th</sup> century (Fig. 28). In order to gain the material, islanders mainly mined the shallow reef flats (*Brown and Dunne 1988*). However, coral mining weakens the reef and reduces the protection the reef provides for the island's coast. In consequence, coral mining is generally prohibited on inhabited and uninhabited islands of the Maldives, which is regulated by the Regulation on Sand and Aggregate and Coral Mining and the Regulation on Coral Mining of 1990. Interviewees noted that the regulation is followed by the islanders as there is widespread problem awareness (*LG03*). According to the survey respondents as well as interviewees, it was not perceived as an active environmental problem today as the city authorities are responsible for making alternative construction material available for the inhabitants, and therefore the coral stones are not needed for construction purposes. The example demonstrates that the island's population has adapted their behavior as a response to government directives and awareness-raising in a case where they acknowledge the necessity.



**Fig. 28: Coral stones as construction material: A traditional house on Fuvahmulah and gravestones (own photos, 2019)**

While coral mining has been identified as a problem of most islands in the Maldives, the sand and pebble mining issue on Fuvahmulah has unique features in comparison to other islands, as the island is known nationwide for its beaches with unique white pebbles. Sand and pebbles have been primarily mined for cultural purposes. The pebbles are used to beautify the front yards of the houses, especially as a preparation for the festivities of *Ramadan*, where the people see it as a necessity to clean the houses and their property and renew the pebbles in their yards (SI 074). Even though sand mining has been prohibited in Fuvahmulah since the 1990s, the survey has shown that it remains a widespread environmental issue and is seen to be one of the

most pressing environmental problems of the island (Fig. 23). Just as the government does for construction material, they also offer imported surrogate materials that should act as an alternative to the pebbles. However, survey respondents reported that islanders continue to rely on the sand and aggregates of Fuvahmulah for numerous reasons (*SI 073*). Firstly, the pebbles from Fuvahmulah are particularly appealing, which the surrogate materials cannot replace in the opinion of the participants. Secondly, the surrogate material is reportedly too costly, and therefore they continue to mine the sand from the local beaches. Some households do not go sand mining themselves but buy it from others who mined the sand on Fuvahmulah illegally. Pebbles are generally collected by hand and plastic bags; however, in some cases, people have reported that people with pick-up trucks come to the beach and collect large amounts of sand and aggregates. Measures have been put in place by the city council to stop sand mining on Fuvahmulah. In several locations that were accessible with vehicles, pillars have been erected by the council in order to make it impossible for vehicles to reach the beach areas (*Fieldnotes, 1/30/2019*). However, numerous respondents have reported weak control institutions, i.e., lacking control through the police and other authorities on the island that enforces the regulations and laws and does not protect the beaches from sand mining (*SII 004, SII 076*). The divisive political situation in the Maldives and on Fuvahmulah has shown to influence the community members' behavior in regard to environmentally friendly and harmful ways. An interviewee reported that people behave according to environmental laws and do not mine sand when the party they support is in power; however, when the opposition party is in power, they mine sand actively. They willingly work against the regulations to show their aversion towards the government while ignoring the negative environmental effects for the island. The survey participant summarized:

“Now they don't mind taking it because they don't like the government. So that kind of attitude is there. So, the political division is a very big issue. If there was more political unity, I think the environmental problems would be addressed better.” (*SII 022, 85*)

The problem awareness and the serious consequences of sand mining were generally present in the respondents: together with the construction of the harbor, sand mining was named most often by the people when asked what they believe is the cause for the coastal erosion problems on Fuvahmulah. However, simultaneously, various interviewees reported that they believe that other inhabitants have an erroneous understanding of their environmental surroundings and the interactions in the environment, and the effects they can have on the environment. They stated that natural elements of nature are unlimited and are incapable of understanding the limited

supply of natural elements (*SII 076*). Therefore, sand mining is a prime example of the limited environmental understanding of some people and lack of problem awareness, as the detailed statement of one respondent highlights:

“You see, everybody is concerned about it, you know? To see that it’s quite bad there. But when it comes to taking action against stopping it, like not to take sands or something from there. When it comes to that, people think that ‘Yeah, it’s just a little bit. I’ll just take it. Everybody else is taking it.’ So, one person does that, and the other person follows them. Even around here, even though most people are educated, most people do it. They take this kind of pebbles from this island. So, it contributes to erosion. Everyone is concerned. So, these kinds of little actions lead to it. That is still not stopped. I think that much of awareness is not there in the society, in the community.” (*SII 022, 40*)

Because people interpret sand mining as a serious problem for the coastal ecosystem, numerous interviewees have reported that when they see people mining sand that they either report them to the authorities or try to persuade them to stop the activity.

### **Key Enablers and Barriers**

Concerning the enabling factors: memories of past hazards and experiences with addressing led to a heightened awareness in the groups on the national and on the local level and the acceptance of the necessity to act on the coastal issues. On top of this, the community on Fuvahmulah has proven to have successfully adapted their behavior regarding environmental problems in response to government directives. With regard to factors hindering local adaptive capacity, on the national level, the national government and especially the MEE have demonstrated a focus on technological, sophisticated, and cost-intensive coastal protection measures as a consequence of recent disastrous events and therefore lack openness towards alternative approaches to protecting the coast. On the local level, a constraining factor for an alternative approach to addressing coastal issues is that regular participation in activities of community members is low. In conclusion, when assuming that experience on the various levels with coastal risks and with successfully addressing them on the local level increases the capacity to adapt, as discussed in part 2.1.4, then the local adaptive capacity on Fuvahmulah must be assessed as mediocre in this regard.

### **5.3.2 Risk and Problem Perception**

The previous part specifically focused on how coastal erosion and associated hazards have been experienced and how the responses to the events were shaped. This part focuses on how actors on the different levels attribute the coastal issues to a cause. This is of importance as it affects the way the issue is perceived to be manageable and with which kind of measures it can be addressed, which influences adaptive capacity. In the first step, the understanding of the different actors regarding the general relationship between climate change impacts and the need for protecting the coast is scrutinized. In the second step, it is demonstrated what causes the actors attribute the coastal issues on Fuvahmulah to. Subsequently, the preferences regarding coastal protection measures are highlighted, allowing insight into the willingness to get involved in alternative approaches to protecting the coast of the involved actor groups.

#### **Comprehension of the Relation between Climate Change Adaptation and Coastal Protection**

On the national level, coastal issues were described to be a central environmental problem as well as a main development challenge of the country by the national government of the Maldives (*NG01*). Coastal erosion problems and the associated risks in the Maldives are widely attributed to climate change by government actors on the national level. In consequence, dealing with coastal erosion problems in the form of coastal protection is generally discussed as one of the most pressing issues in the context of climate change adaptation. Representatives of the MEE stressed that climate change adaptation and the associated efforts to protect the coast are central issues of Maldivian politics and society (*NG01, NG03*). Possible anthropogenic causes for the growing coastal vulnerabilities on the country's islands were neglected by the government representatives on the national level in the conducted interviews in accordance with documents published by the ministries (cf. part 5.2.1) (*NG01*). However, interview partners from NGOs and researchers stated that the effects of human interferences are widely acknowledged by the responsible ministries but that the government is deliberately presenting the country as vulnerable on the international level to attain foreign aid (*NN06*). One consequence of the national government's focus on climate change adaptation with relevance for this study is the focus on technical and large-scale, and cost-intensive responses to coastal issues (cf. part 5.3.2).

While on the national level of the Maldives, climate change has been present in political discussions for at least two decades and has been the focus of a number of studies, there is little known on how the problem of climate change and its linkages with coastal issues are perceived at the community level. The understanding of the cause of the problem is assumed to have an influence on how far the people believe that their actions are able to influence the outcomes. A

first step in the undertaking was to scrutinize what the respondents associate with the term “climate change”. Therefore, the open question “What do you think of when you hear the term climate change?” was asked. The interviewees demonstrated widespread basic knowledge on climate change and on climate change impacts. A large group of people named some impacts of climate change focusing on a general level. The most often-named impacts mentioned were: “rising temperatures” (18 percent of 180 mentions), “sea-level rise” (14 percent), and changing weather patterns in general (10 percent). One interviewee gave an insight on how he feels climate change has affected the island’s environment:

“Sea-level rise. The reef we were sitting and playing in high tides is gone. Now in low tides we can barely see that reef.” (*SI 097*, 62)

Only a small number of respondents brought up coastal erosion (7 percent) or spoke about the personal effects climate change has had on them or will have on them (4 percent), including a feeling of fear or the possible necessity to move elsewhere in the future. One interviewee spoke about the need for adaptation in the form of protecting the coast of Fuvahmulah:

“It is the changes coming to the environment and we need to protect our islands” (*SI 011*, 62)

There were a number of respondents that stated that climate change has anthropogenic causes or demonstrated some more background knowledge than a larger part of the respondents (16 percent). For example, some respondents were able to look further than their regional surroundings and mentioned the global effects of climate change, which the following quote demonstrates:

“Firstly, as Maldivian: The rising sea level. And having worked in a resort, I have heard from other nationals about more snow fall. And the effects of it on the North and South Pole.” (*SI 080*, 62)

Only a few respondents stated either “don’t know” (9 percent of the participants) or stated that they were not aware of climate change (9 percent). A small number of people were voicing doubts about the existence of climate change (1 percent), like the following statement shows:

“Sometimes I wonder if it’s true. Here on Maldives, we are close to the ecosystem, we don't notice much, and coral bleaching is the only one that I have noticed.” (*SI 047*, 62)

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Another minor group of respondents addressed the aspect of climate justice, meaning that the Maldives are affected disproportionately strongly by climate change impacts (1 percent). One interviewee answered:

“Something happening on the global scale. But compared to other regions, it hits us most profoundly. We are not the biggest polluters but affected by it.”

(SI 033, 62)

The small number of participants that spoke about the aspect of climate justice show that the government’s stark focus on climate justice has not noticeably influenced the way of thinking of the community members on the local level. All in all, the survey results did not indicate that people from a specific age group had more knowledge of climate change than people from other age groups.

In contrast to the large number of people who have shown that they are worried about the erosion processes, the responses to this question indicate that the respondents are less concerned about climate change and its impacts. Therefore, it was of interest to understand how the people on Fuvahmulah perceive the relationship between the erosion problem and sea-level rise, which is discussed as the primary problem caused by climate change for the Maldives by government actors. The interest was placed on the aspects if the respondents have observed the effects of sea-level rise on the island and if they perceive it as a threat. These aspects are assumed to indicate the need to improve the protection of Fuvahmulah’s coast. The responses to an open question asking if the interviewees feel safe in Fuvahmulah with regard to sea-level rise revealed that the majority of the interviewees feel safe on their island (53 percent of the respondents). A considerably smaller group stated not feeling safe (25 percent) or expressed an inconclusive statement (22 percent). Numerous interviewees discussed that Fuvahmulah is safer (13 percent of 85 mentions) than other Maldivian islands or even the “safest island” in the country (9 percent). The explanations behind the feeling of safety can be ascribed to the fact that the respondents have knowledge of the geography of Fuvahmulah and are aware that the island is formed “bowl-shaped” (SI 082, 16), meaning that the coastal rim is more elevated compared to the rest of the island (18 percent). One respondent answered the question by describing the topography of the island:

“For the time being: yes. In comparison to other islands, we are the highest. It's shaped that it's higher near the beach and lower in [the middle of the] island.

You can see that!” (SI 080, 77)

Additionally, some respondents (5 percent) remembered that Fuvahmulah was one of the islands of the Maldives that was least affected by the Indian Ocean Tsunami in 2004. The respondents were informed that while the tsunami caused havoc on numerous islands, it did not cause damage in Fuvahmulah, resulting in a perception that Fuvahmulah is less vulnerable than other islands of the country. Yet, the tsunami has become part of the collective memory of the respondents and has increased the risk awareness towards coastal hazards. On another note, feelings of insecurity were also discussed. For one, a number of interviewees (15 percent) believed that future sea-level rise would have an impact on Fuvahmulah. Some (6 percent) discussed the fact that Fuvahmulah's topography in a negative way as well, arguing that once the water got inside the island, that this would cause flooding (*SI 001*). Interviewees were also discussing the aspect of having to migrate to other islands or even to other countries due to sea-level rise (15 percent), which is demonstrated by this respondent:

“If it gets flooded, then we can't survive. We have nowhere to swim. We're located alone. Now, also if possible, I'll leave everything behind and move somewhere else.” (*SI 067, 77*)

### **Attribution of the Coastal Erosion Problem on Fuvahmulah**

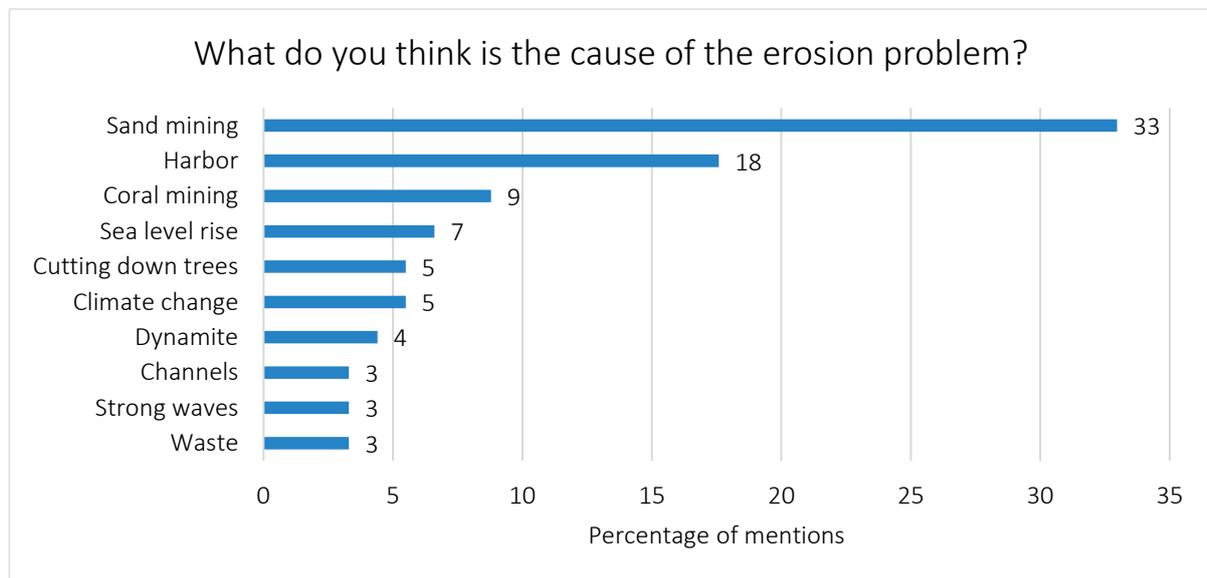
As shown in part 5.3.1, the erosion problem on Fuvahmulah is acknowledged by actors on all levels. There is unanimous agreement that the east coast of Fuvahmulah needs to be protected from further degradation. However, the attribution of the erosion problem to a cause varies strongly among the actors and sectors on the various levels, which has implications on the solution that are thought to be viable by the different actors. While the environmental impact assessment report for the planned revetment on Fuvahmulah states that the problem “is believed to be due to a combination of human interference and natural causes” (*MEECO 2016, 17*), government representatives did not acknowledge this facet. State representatives on the national level mostly spoke about the protection measure for Fuvahmulah as part of climate change adaptation efforts and were not acknowledging possible anthropogenic causes for the erosion problem (*NG01, NG07*). A possible link of the erosion problem to the construction of the harbor and its interference in the dynamics of the island's coast were not mentioned in discussions of Fuvahmulah's erosion problem. Even more, a representative of the MEE was surprised that locals had discussed the harbor as a potential cause of the coastal degradation (*NG07*).

On the community level, the respondents felt uninformed about the causes and the extent of the erosion process on the coast. They reported a lack of information sharing by the responsible authorities regarding Fuvahmulah’s coastal erosion (more on the impacts of lacking trust in part 5.3.3). One interviewee stating:

“On social media, I have seen a lot on the coastal erosion problem. From citizens, I have heard about coastal erosion and the protection of it. But from the government side so far, I haven’t heard anything about it.” (SII 013, 18)

Consequently, and in line with the above-given account, people have relied mostly on informal information in the community. This explains the various responses to the question of what the people think has caused the coastal erosion process, including the continuing sand mining by community members (33 percent of 91 mentions), coral mining (9 percent), and sea-level rise (7 percent). However, numerous mentions (18 percent) focused on the construction of the harbor to be the cause of the erosion on the east coast (Fig. 29).

While the previous part demonstrated the various ways the erosion problem on the coast of Fuvahmulah is attributed to a cause, the following part provides a better insight into the preferences regarding the various types of coastal protection measures.



**Fig. 29: Perceived cause of the coastal erosion problem on Fuvahmulah (n=55, no. of responses=91, only categories with x>2 percentage shown, open question, categorized)**

### Preferences regarding Coastal Protection Types

As pointed out before, coastal protection measures can be grouped into hard and soft coastal protection measures. The latter ones have greater potential to be implemented and maintained by activities of local groups (cf. chapter 1) and thereby enable a local approach to counteract coastal erosion. Therefore, it was of interest in how far these different types of coastal protection

measures are taken into consideration and assessed as interesting by the various groups involved in coastal governance in the Maldives and on Fuvahmulah. It furthermore reveals the level of openness towards innovative solutions.

As discussed, addressing coastal issues has shown to be highly inflexible regarding the approach to implementation in the Maldives' national and local government organizations. This was furthermore underscored by the following findings. According to representatives of the MEE, hard coastal protection measures are seen as the solution to erosion issues within the ministry (*NG01*). Government authorities argued on the one hand that hard coastal protection measures are the only ones that are able to cope with the increasing pressure and risks that the government is expecting for the country's coasts in the face of the climate change scenarios. On the other hand, they argued that hard coastal protection measures are most popular within the Maldivian population because they have proven to be efficient in protecting Male' from damage by the 2004 Indian Ocean Tsunami and because they increase the feeling of safety (*NG01*). Interviewees from relevant organizations discussed that government officials' focus is set on hard coastal protection measures and have not shown openness towards alternative measures (*NN01*, *NN02*). One interviewee added that "the government has not heard of soft adaptation measures" (*NN02*, 139–143). Another reason for the implementation of hard measures given by interviewees was the shortage of human resources in the government authorities that are responsible for addressing coastal problems (*NG02*). Consequently, government offices decide on the same technologies and procedures with which they have collected experience over the years due to a lack of time to develop and work on innovative procedures (*NG02*). The resource constraints also lead to a dependency on international coastal engineering and consulting companies that provide technical expertise and often take over the implementation of coastal protection measures, which generally lead to the construction of large-scale hard coastal protection structures (*Kench* 2012). There have been little efforts in government authorities on developing ideas for measures that are implementable by individuals and groups on the local level. According to some critics on the national level and on Fuvahmulah, the preference of the responsible authorities at the national level in favor of hard coastal protection measures can also be found in two political factors: to gain popularity in the electorate on the one hand and due to corruption on the other hand. Firstly, experts, as well as survey respondents, have argued that hard coastal protection measures are chosen by politicians to gain popularity because the general notion is that most island inhabitants prefer hard measures (*NN01*, *NN02*, *NG05*). Secondly, respondents argued that they believe the motivation of the decision-makers

to prefer hard measures is that it is easier to embezzle money from large-scale projects than from less costly small-scale projects (NN03).

The inflexibility of the local government can be derived from the city council's high financial dependency on the national government regarding coastal adaptation measures. According to interview partners, the city council is entirely dependent on the actions and decisions from the national level (NN02).

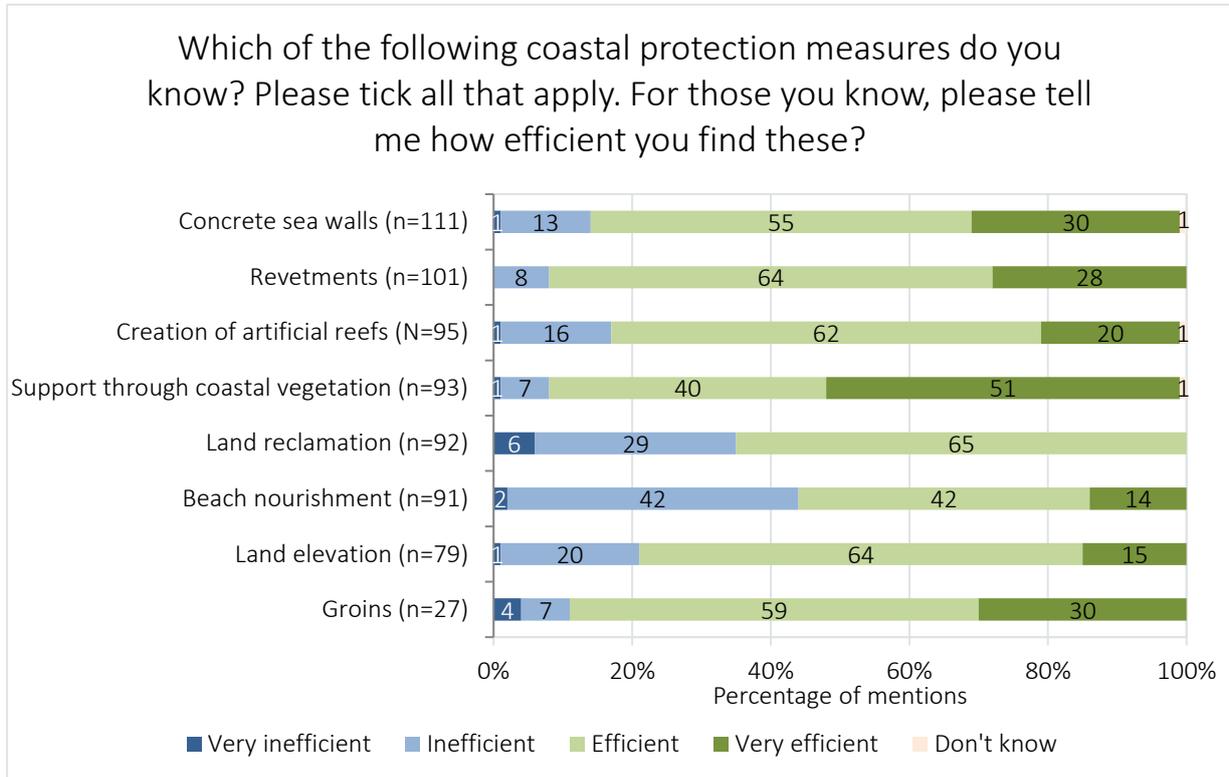
On the community level, preferences regarding coastal protection measures have been found to be more differentiated compared to government representatives. In order to understand the preferences, knowledge, and opinion of the respondents, the interviewees were given a list of coastal protection measures with nine different items. Five of the items on the list can be seen as belonging to traditional hard measures; the other four can be categorized as soft measures. Due to the technical terms for some of the hard coastal protection measures that are difficult to understand by non-native speakers and also difficult to translate, it was decided to present the following measures with an attached picture: groins, revetments. In a first step, it was asked which of these coastal protection measures the respondents know. Almost all respondents have heard of the term "concrete sea walls" (112 of the 116 respondents). The respondents were also highly familiar with revetments (105 respondents). However, interestingly, a large number of participants stated to have heard about the soft coastal protection measures "creation of artificial reefs" (95 respondents) and "support of coastal vegetation" (93 respondents) (Ratter et al. 2019, 175). For measures known, the respondents were asked how efficient they assessed these measures to protect their coast on a four-step scale from "very inefficient" to "very efficient". Concerning the assessment of the efficiency of the coastal protection measures, when merging the answer options "very efficient" and "efficient", the three most positively ranked were: "revetments" (92 percent positive responses), "support through coastal vegetation" (91 percent), and "concrete sea walls" (85 percent) (Fig. 30). "Groins" were neglected in the comparison because only a very small number of respondents were familiar with this measure (Ratter et al. 2019, 175). A follow-up question underlined the statements of the respondents: The respondents were asked if they could choose one coastal protection measure for Fuvahmulah, which one they would prefer. "Revetments" were named by 43 percent of the respondents and the first choice by far, followed by "concrete sea wall" (22 percent) and "support through coastal vegetation" (19 percent) (Fig. 31).<sup>18</sup> The comparison of the two categories of coastal protection

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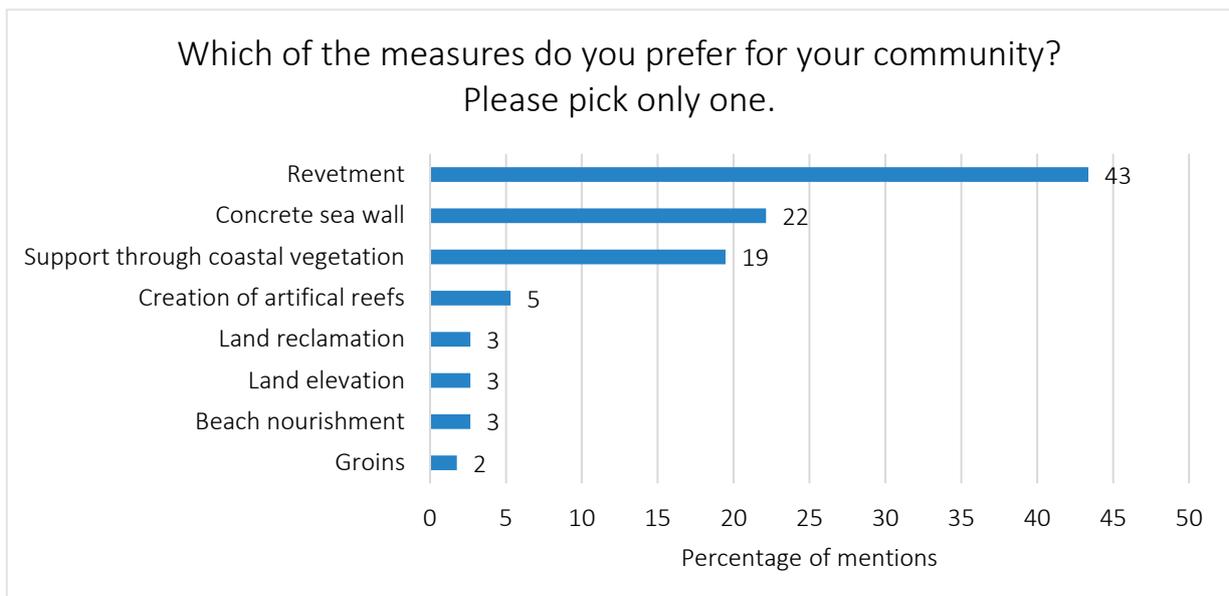
<sup>18</sup> While the question specifically asked for one measure, five respondents named two measures. In this counting, only the first-named measure is listed. For the sake of completeness, the second-named measures were: Support

## Assessing Local Adaptive Capacity of Fuvahmulah

measures show that traditional engineering measures generally have higher credibility in Fuvahmulah, but that soft measures are also widely known and perceived as interesting – an aspect that has been found to be surprising by agencies close to the government as they believed that hard coastal protection measures are seen as the best solution by the population on the local islands (NN05).



**Fig. 30: Assessment of coastal protection measures (n=115, structured question)**



**Fig. 31: Preferred coastal protection measure for Fuvahmulah (n=113, open question)**

through coastal vegetation (three respondents), revetment (one respondent), creation of artificial reefs (one respondent).

### **Key Enablers and Barriers**

The assumption in part 2.1.4 was made that the perceptions and understanding of risks and associated problems influence the adaptive capacity by defining the way which solutions are seen as preferred by the various actors that allow a common ground to respond to the pressures.

With regard to enabling factors, all actor groups on all levels regard the erosion issues on the Maldives in general and especially on Fuvahmulah to be of high urgency. Furthermore, the people on Fuvahmulah argued that the erosion has been caused by the interferences by people and thereby indicate that their actions can have an influence on the health of the coastal ecosystem. This can be seen as enhancing local adaptive capacity, as the people on Fuvahmulah perceive the issue to be manageable on the local level and through locally implementable approaches.

Hindering factors for local adaptive capacity include the differing attributions of the cause of the erosion issue on Fuvahmulah. The national government actors exclusively focused on discussing the erosion issue in the context of climate change impacts and climate change adaptation. Anecdotal evidence gained through the experiences of addressing coastal risks in the past has been used to argue in favor of this approach, which is used to explain the current approach by national-level politicians. It is likely that the conservative interpretation of the government actors on the national level and also on the local level hinder the development of local adaptive capacity as no alternative approaches are taken into limited consideration only. On the community level, there are indicators that the people's opinions on Fuvahmulah are not widely influenced by these discourses. Climate change is something abstract, and few perceive it as something threatening. The urgency that national politicians place on climate change and sea-level aspects for the future of the island country is not reflected in the attitudes of the local population on Fuvahmulah. There are grave doubts on the community level that climate change is the cause for erosion processes, but rather see the anthropogenic influences as the cause of the problems. The lack of identifying, naming, and addressing the root of the cause of the erosion issue by the national and local politicians has contributed to a feeling of being misguided and misinformed in parts of the community. While the people's attribution of the coastal erosion issue on Fuvahmulah is largely not associated with climate change, the discourses have left their marks on the Maldivian people. These can first and foremost be seen in confusion and different perceptions and beliefs of the different followers of the main political parties, which reduce the likeliness of finding commonly accepted solutions to coastal erosion. In summary, there is a gap at the community level between the assessment of coastal erosion as a pressing problem of

the people and the low perception of feeling at risk by climate change impacts and sea-level rise despite the focus on these topics by national-level actors. There is a discordance between what the politicians on the national level discuss as the causes for coastal erosion on the Maldives and what the people on the islands perceive as causing the coastal problems. This fact reduces the likeliness of collaborative relationships between the levels.

### **5.3.3 Comprehension of Responsibilities for Action and Policy Preferences**

In this section, it is shown how the actors representing the two relevant levels of government as well as the community members interpret their own responsibilities for action and the responsibilities of the other actor groups in the context of addressing coastal issues. Furthermore, where it is appropriate in the investigation, these understandings are compared to the specifications of the formal institutions. It is assumed that the role understanding enables or constrains actors' willingness to be part of activities dealing with coastal problems (cf. part 2.1.4). In the following, it is demonstrated how the investigated groups on the different levels understand the responsibilities for action regarding the addressing of coastal issues and what factors have influenced this. In a first step, it is demonstrated how the representatives of the groups on the different levels understand the responsibilities for action of the national and local government. In a second step, it is scrutinized how the different levels understand the role of the community in activities dealing with coastal issues.

#### **Comprehension of Responsibilities for Action of the National and Local Government**

Representatives of the national government, intergovernmental organizations, and research institutions argued that coastal issues in the Maldives are acted upon centrally on the national level by the national government. Actors on the national level were seen to be most responsible in the Maldives, and measures are planned, coordinated, and implemented by dominant governmental actors on the national level – especially the MEE and the Environmental Protection Agency were underlined as the most important authorities (*NG04, LG07*). In line herewith is that the decision-making process regarding the planning and implementation of coastal protection measures was understood to be implemented in a top-down approach, and the power to make binding decisions is located primarily within the MEE (*NG02, NN03*). In interviews with representatives of the ministry, this approach to dealing with coastal issues was discussed as a matter of fact without revealing interest in considering non-government actors in the decision-making process in more depth or sharing power with lower levels of government (*NG01*). This understanding of the national government's role was widely accepted in the local level government. Former and current city council employees recognized that the financial, technical, and

human resources, as well as the decision-making power, are located at the national level (*LG02, LG07*). While the survey on Fuvahmulah revealed that the community also understands the role of the national government to plan and implement coastal protection measures as the dominant actor, the understanding of responsibilities for action is more differentiated as the following parts set forth.

According to interviews and in regard to dealing with coastal issues, representatives on the national level made it clear that in their understanding, the task of the city council is limited to informing the MEE about coastal problems on Fuvahmulah, i.e., to escalate the problem to the national scale (*NG01*). This perception of the role of the city council was confirmed by other interviewees on the national level, by the city council, as well as by parts of the community (*NN03, LG07*). Concerning the council, it was revealed that even though they are aware of the erosion issue on Fuvahmulah, the council lacks resources and confidence in being able to react to the problem – they feel dependent on the national government when it comes to planning and implementing coastal protection measures. The implementation of the *Decentralization Act* has so far not noticeably altered the understanding of the responsibilities in regard to addressing coastal problems in the government entities of the coastal governance system (*NN02*). Even though the *Decentralization Act* emphasizes the allocation of more power to the local level and to institutionalize cooperation across the different government levels, ministries at the national level were found to play the dominant role. The island councils only have a supportive role in the decision-making processes, according to interview partners involved in coastal governance (*NN03*). Interview partners explicitly stated that they expect that the new administration under President Solih will put more effort into the decentralization process and expect changes regarding dealing with coastal issues to include local-level politics increasingly (*NN07*).

With a focus on what community members believe is the current allocation of responsibilities, the respondents were asked to identify key persons or groups that are responsible for tackling climate change on Fuvahmulah in an open question. The respondents stated that the most important actors are primarily located on the island level (75 percent of 117 mentions). On the one hand, the political actors located on Fuvahmulah were seen as key persons, mainly the city council in general (21 percent), but also individual members of the city council (3 percent) were named to be important for the development of the community. On the other hand, the citizens of the island themselves are seen to be even more important (39 percent). Respondents argued that decentralization had shifted the power to the local level:

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“Now, at the moment, the government is giving all the power, decentralization is here. All the powers are here at the city council. The most influential is the city council, they have manpower and the possibilities, I believe.” (SII 002, 13)

Nevertheless, the important role the respondents ascribed to the local government is relativized when taking the following aspect into consideration: Numerous respondents have argued that the role of the local government remains to inform the actors on the national level of problems concerning the environment on Fuvahmulah, who are mainly responsible for acting in the face of arising environmental problems, as the following statement underlines:

“At this moment in time, as things are panning out, it’s the city council that has the most authority. But then again, when it comes to people doing something about the mistreatment of the environment, it’s the Environmental Protection Agency. What the city council can only do is to inform the EPA that this is happening, and EPA people are in Male’. I think having one of them over here to attend to these issues. Like a couple of officers over here could help a lot.” (SII 012, 24)

The above-given statements underline that the formal allocation of power to the local level as a result of the decentralization process has been acknowledged by the community; however, the understanding that the general power and authority remains at the national level was present. Interestingly, only 15 percent of the respondents named the national government as an important actor in the context of counteracting climate change effects on Fuvahmulah. In the 2017 survey, a similar question asked who participants believe is most responsible for the development of the community. The results closely resembled those of the second survey in 2019, thus indicating that the perception of the status of the execution of decentralization remained on the same level.

### **Comprehension of Responsibilities for Action of the Community**

In the following, the understanding for action of the community in activities dealing with coastal problems is assessed. Furthermore, it is shown in how far community members are and have been involved in relevant activities. The focus is on how the different groups understand the role of the community, encompassing the broad spectrum of options, from participating in the decision-making process to actively participating in activities concerning coastal issues. The part furthermore investigates the rationales for the varying perspectives. On the one hand,

community members are able to support the development of more suitable measures in cooperation with government and non-governmental actors by providing knowledge and/or actively participating in the implementation. On the other hand, depending on the understandings, the community might also be more independent and implement their own activities through, for example, supporting the coastal ecosystems or constructing small-scale coastal protection measures. The part, therefore, provides a foundation for understanding if local adaptation approaches are possible.

According to the formal institutions, especially shown by the *Decentralization Act*, island communities must be involved in the decision-making processes regarding development projects in the Maldives in the form of consultations and public meetings (cf. part 4.2.3). Practically, however, there is little involvement of the community in Fuvahmulah regarding development projects and, specifically, coastal protection measures. This was reflected by the lack of openness by representatives of the national government towards the inclusion of the community in development projects under President Yameen (NN02, NN07). An interviewee from NGOs pointed out that community involvement was pursued more by the government under Nasheed. However, NGO representatives stated that they are cautiously optimistic that a shift towards stronger involvement of the community by the national government is becoming more likely because of the election of President Solih (NN07).

On the community level, with the aim of understanding how people on the local level understand their role in the decision-making process regarding development projects, a question was asked whether the respondents are interested in being more involved in the decision-making process regarding the development of the island. A large majority of the interviewees (83 percent of the participants) stated that they were interested in being more involved, while 15 percent were not interested. Those who expressed that they are interested in more involvement were asked to give examples in what ways they could envision being more involved. The respondents mainly wanted to give more advice and consult more with the decision-makers (53 percent of 94 mentions), which is demonstrated by this statement of one interviewee:

"Especially for the things I am interested in. Especially, when they plan for a project, they could do surveys." (SI 066, 45)

Two participants of the second survey gave interesting insights: one argued that decisions regarding environmental protection would improve when community members are talked to:

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“It is important to have influence as two people’s ways of thinking is always different, so if they include a few community members in decisions, it will be better for the community.” (*SII 070*, 32)

The second participant stated that local politicians are not knowledgeable enough and that the involvement of members of the community will bring benefits, as the statement demonstrates:

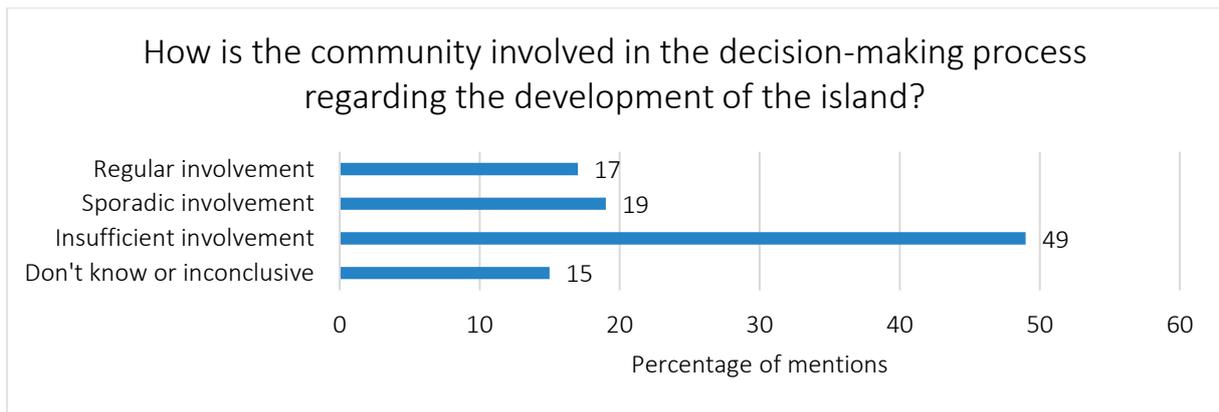
“Politicians on the local level, even though they get elected, they don’t have a lot of knowledge. Politicians should take the knowledge of the senior members of the community into account. They know a lot about the island.” (*SII 079*, 23)

Others argued for more regular information-sharing activities between the community and the politicians, such as events where the authorities report to the community about plans and raise awareness about environmental problems (*SI 024*). Another group of respondents was willing to participate more practically, such as joining committees or participating in fundraising activities (27 percent). Another idea that was brought up by a group of interviewees was to give funds (2 percent) for projects that they support. Others proclaimed the wish for environmental activities in which they could participate.

21 percent of the interviewees stated that they were interested in participating more but did not give a concrete example of how they would like to do this. Other respondents gave reasons why it is impossible for them to participate more, first and foremost, time constraints. A smaller group of respondents (9 percent) are critical about increased integration of community members: some argue that only people with expertise regarding a topic should be consulted, others argued that past decisions of the community have led to negative consequences for the island:

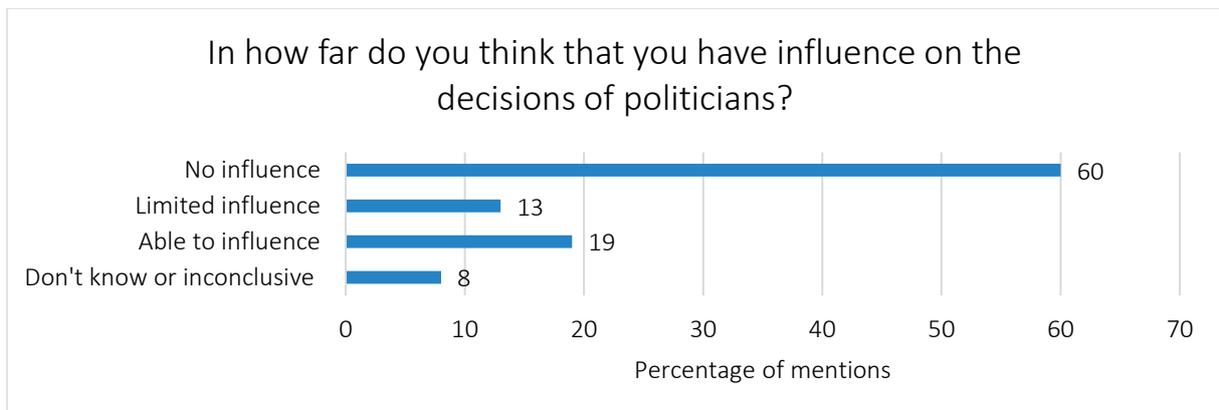
“They have proven not always to act in the best ways. For example, the eight channels of the island, those were wanted by the population and proven to be bad.” (*SII 076*, 14)

In order to understand whether the inhabitants of Fuvahmulah are satisfied with their inclusion in development issues on the island and thereby understand if there is more interest in involvement in the future, the survey included the open question to what degree the community is integrated into decision-making processes concerning the development of Fuvahmulah. Only 17 percent of the participants reported regular involvement, while 19 percent stated that there is some involvement on occasion. However, 49 percent of the respondents stated that the community is seldomly or not involved in the process (*Ratter et al. 2019*, 176) (Fig. 32).



**Fig. 32: Perception of community involvement in decision-making process (n=115, closed question)**

The responses resemble the answers to a question of the second survey in which the focus was put more strongly on environmental protection activities and in which it was asked how far the interviewees believe that they are able to influence political decisions regarding environmental protection. More than half of the respondents on Fuvahmulah (60 percent) felt that they are unable to shape decisions on environmental protection, while 13 percent stated that there is some influence, and about one out of five (19 percent) stated to be able to influence decisions (Fig. 33).



**Fig. 33: Community members influence on decisions of politicians (n=95, open question, categorized)**

Some respondents were giving an insight into reasons why they believe there is little involvement of the community. Of these, numerous discussed the impacts of politics and of the political changes on society in the Maldives and how that has brought confusion and disturbances with it (15 percent of 92 mentions), demonstrated by one interviewee that focuses on the democratizations process that began in the 2000s:

“Since we are in the process of political changes. So, the community is not much involved. Mainly the councils and the local authorities [are involved]. The public is not that much interested, still in learning process.” (SI 080, 43)

Some of the respondents were clearly frustrated with the situation of the community's involvement in environment-related projects by the council and other governmental levels, as the following respondent's statement reveals:

“I don't think that we have much say in the decision-making process. We do try to, like whistleblow, why they are constructing roads, why they are cutting down trees when they are not mentioned in any plans, so in the EIA. In those cases, the most we can do is to raise our concerns on social media. There is not much else we can do.” (*SII 022, 33*)

Another respondent focused on the rivalry between the two major political parties, which is making the political landscape on the local level tense and is affecting the way that the community can get involved:

“It's political. There are two parties on this island. They do not get along. That makes it hard for the community.” (*SI 029, 43*)

Individual voices expressed the opinion that decision-makers only have their own party, friends, and family in mind – and not the whole community.

“They only work together with those that are close to their parties. It's always the way that politicians act like here. There are never any activities across the borders. This is true for the national as well as the local level.” (*SII 079, 23*)

One respondent was even stating that the political parties are deliberately slowing down improvements for the island in order to punish the other party:

“What I found in this island is that there are two major parties there, the MDP and the PPM, before. Those two major parties have so many conflicts. If somebody is trying to protect the environment, and it's going successfully, then the other party will try to stop that. (...) That is what is happening; everything is happening like that in here. I mean, two political parties get together and don't try to do anything for the community.” (*SII 004, 33*)

Also, respondents stressed the lack of sincerity of politicians, arguing that politicians only consult with the community during election campaigns with the goal of gaining popularity. This is the reason for some respondents that the community has lost trust in politicians and willingness to get involved (*SII 053, SII 089*). However, the respondents do not see the political actors as

the sole source of the problem of missing involvement of the community and the lacking cooperation between the community and the government authorities. The respondents stated several reasons why the community is not interested in strong cooperation with the political side. Firstly, people have lost the understanding of how important it is to work together with decision-makers as one respondent describes:

“People are not aware of the importance of working together. Community should get engaged more with the politicians. Politicians could know more if there were more interest. Politicians are trying. Due to freedom of citizens, they [community members] do not have the feeling they need to help. Formerly the people had the feeling it was a must to help the community leaders, but now there is too much freedom. (...) There is not enough awareness for the consequences of the actions of one’s action.” (SII 087, 31)

Secondly, some respondents stated that solving environmental issues has become the lone responsibility of the government. In their opinion, the government’s task is to hire contractors, who undertake the tasks that were formerly implemented with the support of the community, as the Maldivian population today pays taxes and does not have the time to deal with environmental and developmental aspects of the island anymore (SII 083, SII 044). Thirdly, respondents argued that people are not aware of environmental problems anymore as they have lost touch with their environment (SII 053).

Respondents voiced criticism towards other inhabitants of the islands who are uninterested in participating in development issues (4 percent), underlined by the following statement:

“Some citizens don't give much importance to those kinds of things. But those who want to get involved are always there.” (SI 087, 43)

Those who stated there was cooperation between the government and the community described that the two actor groups listen to each other, trust the actions of the other, and are able to develop projects and ideas together, as a respondent replied:

“They work together enough. If the government wants to do something and the community is against it, they will stop it. And if the community wants something, they will pressure the government. It works well enough.” (SII 058, 31)

17 percent of the interviewees responded that they believe that the community is involved sufficiently but that there is room for more participation.

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The general feeling of lacking involvement of the community was underscored by the responses to the question whether people had attended a community meeting regarding environmental issues, which allows them to voice their opinion and thereby influence the development of the island. A large majority of the community members report that they have not participated in any community meeting regarding the environment. Even more, numerous community members (14 mentions) complemented the information that they had not heard of the city council organizing any community meetings regarding the environment. Some were reporting of concrete examples in which the public was never consulted, like this statement shows:

“Like the example of the construction of the sewerage plant: No public consultation or survey was done. I would like to be more incorporated.” (*SI 005*, 45)

While some respondents reported community meetings taking place, some remarked that environmental issues are rarely discussed in these meetings compared to other topics, such as health issues. A respondent pointed out that not all community members are invited to community meetings, but rather that the responsible people only invite community members where they can count on their support for a proposed project due to personal or political connections (*SII 045*). All in all, the responses reveal that the community feels that formally planned meetings between the community and the government are not implemented well. Consequently, numerous respondents replied that they rely on personal relationships with members of the council and decision-makers to influence the development of the island rather than on official channels (*SII 036*). The lacking consultation with the community is illustrated by the environmental impact assessment process for the revetment on the east coast of Fuvahmulah. The EIA report states that two meetings with the community took place, which is mandated by the Environmental Impact Assessment Regulations (*MEECO 2016*). However, a majority of respondents have stated that they were not invited to community meetings in regard to the environmental impact assessment for the revetment.

Statements by NGO representatives confirm that the communities are not involved in the management of environmental and development projects due to a lack of interest by the responsible government authorities and view it as a weak point of environmental management in general and the approaches to dealing with coastal problems in particular, leading to a neglect of the interests and opinions of the local population (*NN07*). On the same note, specifically, a lack of including women in the decision-making processes was criticized by an interviewee in environmental management issues (*NN03*).

## Assessing Local Adaptive Capacity of Fuvahmulah

In contrast, members of the local government have given account that they conducted community meetings regarding environmental issues and invited all inhabitants of Fuvahmulah. However, they state that the interest of community members to take part is limited (*LG05*). Despite the feeling of lacking involvement of the community, there are examples where the community on Fuvahmulah has been actively involved in past development projects. According to survey participants and interviews with former ward councils, infrastructure and construction projects in Fuvahmulah were made possible due to the cooperation between the city council and the community. Examples given for development projects that were implemented without the support of the national government are, for instance, the construction of roads, the construction, and maintenance of the drainage systems, the construction of the GN Atoll Education Centre, the access channels around the island, as well as the revetments around the island (*LG01*). Also, there was an agreement between the council of Fuvahmulah and the national government that the airport would be built if the people on Fuvahmulah ensured that the area would be cleared of vegetation (*Fieldnotes, 2/6/2019*).

While most community members (26 mentions) stated that the involvement of the community by the national and local government had been the same in the past, a large group of respondents (21 mentions) have given account that current involvement is worse compared to past times. The respondents argued on the basis of historical and contemporary examples. For example, the introduction of the democratic system and political parties has been discussed from a positive as well as a negative perspective. On a positive note, some argued that the politicians are now deemed to talk to the community in order to get their votes:

“It’s something positive. In the early days, they will just be doing their things. With the democracy, they are forced to come and reason with us. And the thing is that, if they are listening to us, there is a huge possibility that they will think about it, our concerns. And at the same time, they would know if our concerns are not solved, it will be difficult to get votes next time.” (*SII 020, 77*)

Some respondents voiced the opinion that they felt that cooperation between the community and politics in environmental protection activities worked better during the administration of one party compared to the other. For example, one community member stated:

“During Nasheed, they always asked what the community wanted, and it was only a short period, but they always tried to involve the community members. (...) I’m hoping for a new MDP president that it will improve again.” (*SII 057, 34*)

## Assessing Local Adaptive Capacity of Fuvahmulah

To elaborate on this aspect, it was shown that the discourses on climate change and adaptation that have been utilized by the political elite had had an influence on how individual community members understand their role in participating in questions of the development of the island. An interviewee has reported that during the Nasheed administration that strongly promoted the involvement of community members in climate change issues, a group of young adults grouped together to become active and make Fuvahmulah the first zero-carbon island of the country and thereby making Fuvahmulah a model project for the Maldives. The group of youngsters was influenced by Nasheed's narrative that all Maldivians were responsible for making the country sustainable and a role model in mitigation efforts on the international level. However, after Nasheed was ousted from office and Yameen became president, the group split apart (*LN02*). Another respondent gave a similar account that he and a group of friends formed an NGO during Nasheed's time in office that focused on planting coastal vegetation and promoting more eco-friendly ways of living on Fuvahmulah (*SII 057*). The influence of Nasheed on the behavior and the attitude towards pro-environmental behavior of the people on Fuvahmulah was summarized by another person in the population survey:

“Under Nasheed, he used to talk a lot about environmental protection. It had an influence on people because it made them more aware, and things like waste management became true. Politicians after him talked a bit less about the environment, and that reduced environmental topics in general society again.”

(*SII 026, 32*)

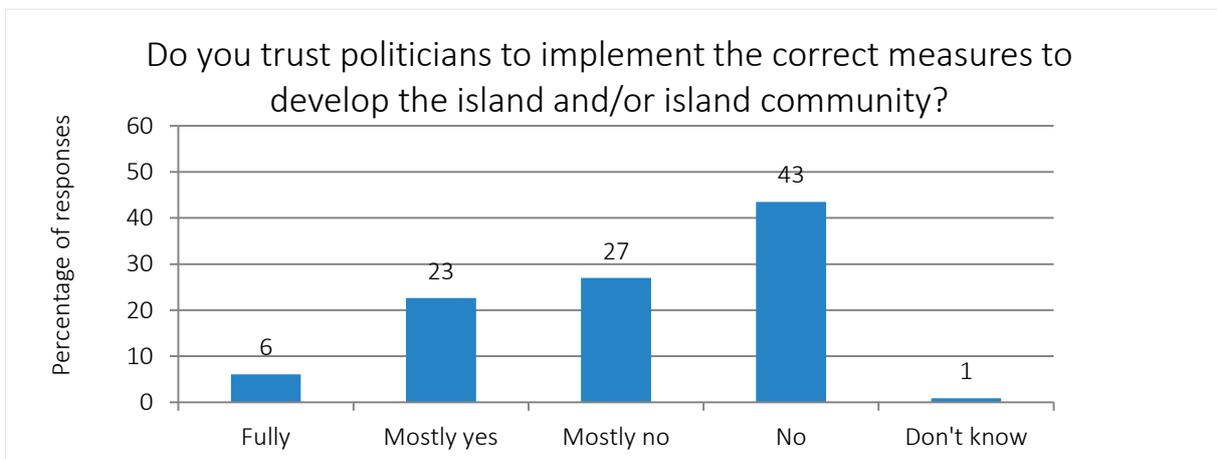
Focusing on a more historical perspective and according to statements of former island councilors, the understandings of the role of the community regarding its involvement in projects concerning the development of the island has changed fundamentally over the last decades. Until recently, the community in cooperation with the island and ward councils acted in a more autonomous approach, illustrated by the self-directed implementation of development projects. However, according to the elders, the feeling of responsibility has changed, and currently, they have doubts that people would be willing to get involved in group activities as people expect services to be delivered by actors on the national level. According to the former chiefs, the reason for this shift of willingness to engage in community activities is first and foremost the introduction of a currency that altered the understanding of responsibilities and relationships within the community. Also, before the introduction of currency, people relied on trading and supporting each other, which changed after the currency was introduced. In consequence, the

feeling of community in general changed, and people outside their families alienated themselves from other community members. This included that the focal groups of the people have become smaller (*LG06, LG08*).

To summarize, community members, unlike in the past, felt to be insufficiently involved in addressing coastal problems. However, they demonstrated a large interest in being involved in the decision-making processes and in activities. A main reason for the lacking involvement was the political conditions in the country, which have resulted in a worsening of the relationship between the government on the national and local level and the community. As collaboration between the levels is important for adaptive capacity and trust is fundamental for this, the next part focuses on understanding the degree of trust between these groups.

**Lack of Trust as a Reason for Lacking Community Involvement**

Trust is deemed essential for cooperation between actors and actor groups and is therefore important for local adaptive capacity (cf. part 2.1.4). A functioning relationship between the community and decision-makers is important for community support of development projects due to the number of dependencies that emerge when working together. These include that agreements between the two groups are complied with. To get a picture of the degree of trust in the politicians, the questionnaire included the structured question: “Do you trust politicians to implement the correct measures to develop the island and/or island community?” All in all, the responses showed a low level of trust in the politicians in this regard. More than two-thirds of respondents stated either “mostly no” (27 percent of the respondents) or “no” (43 percent). While 23 percent responded that they somewhat trust the politicians, only six percent answered with “yes” (*Ratter et al. 2019, 176*) (Fig. 34).



**Fig. 34: Trust in politicians (n=115, structured question)**

## Assessing Local Adaptive Capacity of Fuvahmulah

The lacking trust of the community can be found regarding the national government as well as the local government. A low number of respondents distrusted its government to such an extent that they responded that they were not willing to participate in any consultation with politicians in a following question (2 percent of 95 mentions). This sentiment is underlined by the following interviewee that highlighted the practice of favoring political allies by the country's powerful actors:

“If they want our opinion, we would like to give it to them. But there is no system – only always to the party, but not in general.” (*SI 092*, 45)

Apart from this assumed nepotism, corruption was also named by respondents on Fuvahmulah to have decreased the trust in the activities of the national and local government (*SII 048*). Connected to this aspect, several community members in Fuvahmulah have reported little trust in the control institutions on Fuvahmulah, i.e., that authorities and police fail to enforce regulations and laws. One drastic example was told by one community member who reported that he saw a police officer catching people in Fuvahmulah that were hauling sand in a truck away from the beach. However, he ordered the sand miners to bring the sand to his house rather than fine them for the illegal activities (*SII 094*). The survey revealed that islanders wish to see more assertiveness of the authorities and people in power. Various people want to see new laws that focus on stopping environmental degrading activities put in place, such as cutting down trees, while another group of respondents (9 percent), such as the following statement demonstrates, want the already existing laws to actually be enforced:

“Politicians have to be more responsible and should fine the people that take sand. From the national government: They should assign people as security guards to protect the beaches and stop people from taking sands.” (*SII 053*, 31)

The rift along political lines has furthermore caused a deterioration of trust in non-governmental organizations, which are an important bridging actor in coastal governance in the Maldives. This was shown by doubts of respondents regarding the neutrality of NGOs. For example, respondents argued that they are unwilling to participate in activities from specific NGOs on the local level as they believe they are politically biased or because they have perceived that only members or supporters of a specific political party engage in a certain NGO. Some people voiced concern that NGOs are also only part of the political establishment in the country and that they get instrumentalized for their tasks and are therefore not impartial (*NN07*). On Fuvahmulah, one interviewee spoke of his concerns that a local NGO has only become active

shortly before the 2019 Presidential Election and that he expects that the NGO will stop its activities shortly after the election (*Fieldnotes*, 2/8/2019).

### **Understanding of Community Involvement in Activities Dealing with Coastal Issues**

While the previous part focused on community involvement in environmental development projects in general, the following section gives a more specific insight into the understandings of the role of the community regarding activities dealing with coastal problems. The part investigates the potential for stronger involvement of the community, according to respondents.

As described before, the implementation of activities dealing with coastal problems in the Maldives is widely perceived to be a task for which the national and local government is responsible. For this study, however, it was of particular interest to understand if there is potential for alternative approaches that encompass a stronger involvement of the population on the islands as well as alternative measures that protect the coast. Responses to an open question asking broadly under what circumstances the respondents could imagine getting involved in measures that prevent further coastal degradation in the future revealed disunity in the respondents on Fuvahmulah. Many (45 percent of participants) stated that they could imagine getting involved in measures that aimed at protecting the coast and named various activities as examples: planting vegetation, stopping taking sand, donating money to the cause, or raising awareness among other community members to alter their environmentally degrading behavior. One respondent emphasized:

“Yes, we can. In some other islands, they are actually doing it by themselves. You know, they are putting sandbags by themselves near the shore. We can do something like that. But I think, (...) the majority of the community are waiting for the government to do something rather than doing something by themselves.” (*SI 038*, 35)

Numerous respondents stressed how vulnerable they feel in regard to the coastal erosion processes that they observe at their coast as a motivating factor to get involved in the implementation. One interviewee responded:

“I would like to do something now already. It’s to protect the island for future generations. Even if I die, I want to know that my children and grandchildren are protected by the island.” (*SI 087*, 27)

Numerous people spoke about the need for leadership concerning activities in the context of addressing coastal issues, as they stated that they would want to get involved if somebody initiated island-based activities. 26 percent stated that they might get active if the problem gets worse. Some noted that they believe that it is the government's responsibility, but if they see that nothing is done in the near future, then the island's population needs to become active. Various respondents argued that the community is fully impotent in reacting to the erosion processes on Fuvahmulah – one respondent arguing that the problem:

“It cannot be solved by the community. Will need government intervention. There will be something heavy built needed.” (*SIH 083*, 21)

Two percent stated that they are not willing to participate in any activities due to the lack of possibilities or interest, while the remaining 9 percent of the answers were either “don't know” or an inconclusive statement.

### **Key Enablers and Barriers**

Regarding enabling factors, the community on the local level showed a large interest in stronger sovereignty of the lower level, which has been ascribed to them by laws and regulations that formally put the actors and the community on the island level in the foreground of actions. In addition, the community has shown to be more open to experimentation regarding the types of coastal protection measures as well as the role of the community within the planning and implementation of measures to address coastal issues. Furthermore, NGOs have proven to play an important role in enabling the community to get more involved in the activities. However, on the constraining side, the formal shift of the understandings seems not to have changed the way the authorities in power understand the responsibilities. This is underscored by the high degree of discontent by the people of the involvement of the community in the decision-making process. The above-given inquiry has clearly shown that there are widely varying interpretations of the responsibilities on the different levels of the governance system. In general, the dynamic past years in the politics of the Maldives have been shown to have influenced the understandings of responsibilities at the lower level. The employed discourses by the national elite that altered radically between administrations have left the people on the island confused and unsure of their role.

In summary, the understanding of the responsibilities for action and preferences regarding policy indicate high divisiveness between the levels, which limits the adaptive capacity on the local level. The understanding of the community regarding the allocation of roles has been clearly

influenced by formal institutions. However, the national government authorities have not been acting according to the altered regulations, which constrains adaptive capacity on the lower level.

#### **5.3.4 Collaboration and Power Distribution**

In the following part, it is scrutinized how far different groups are represented in coastal governance, how they collaborate with each other, and how far they can influence how coastal issues are addressed. By analyzing these factors that are coined by formal and informal institutions, it can be understood how the involved actors and groups influence the way others are either allowed to be involved or not. It is assumed that the more heterogenous the involved groups are and the larger the integration of different opinions and interests, the more equitable the system is and thus the higher the adaptive capacity.

According to interviewees, the coastal governance structure is coined by dominant government actors on the national level, as power and authority are allocated within the MEE and the Environmental Protection Agency (*NN01, NN02, NN03*). The President's Office has great influence in the decision-making structure and was named as a powerful actor as well, which can be led back to the high authority regarding the allocation of financial resources and high authority in the decision-making process (*NG01*). The need for improved collaboration between different government sectors and between the different political levels in climate change adaptation and in dealing with coastal issues is a declared aim by actors on the national level in the Maldives (*NG05*). The determination to increase collaboration is underscored by the various documents on climate change adaptation that have been published by ministries to demonstrate the effort of the government to support collaboration between sectors and levels of government, including the *Maldives Climate Change Policy Framework* of 2015 or the *National Climate Change Research Strategy* of 2012 in which partnerships and coordination between the different parties are stressed. On top of this, the increased collaboration among the various levels is a declared objective of the decentralized governance structure. However, an interviewee reported that the governmental coordinating structures had not adapted their actions to these declared ambitions. The acting in sectors within the government is seen to be highly prevalent and is assessed as a hindering factor for effective governance (*NN03*). Interviewees reported lacking coordination between ministries and departments and between the government and other groups (*NN01*). According to interviewees, the missing horizontal links are the result of lacking human and financial resources that lead to excessive workloads for employees of the MEE and the EPA.

Consequently, responsible employees in the ministries lack the willingness and possibilities to reach out to other actors and collaborate with other sectors (*NN03, NG02*).

There are differing opinions on vertical links among the interviewees. Representatives of the national government stated that other actor groups, such as NGOs and island populations, are strategically involved in the planning of coastal protection measures and argue that regulations, such as the *EIA Regulations*, demand for direct coordination with actors that are not part of the government (*NG01, NG02*). External observers, however, report that government actors do not follow the formal institutions, leading to lacking involvement of non-government actors (*NN02, NN03*). However, NGOs and intergovernmental organizations, such as the UNDP Maldives, on the national level, have shown to attempt to strengthen the role of the communities as well as the role of non-government groups in addressing coastal issues (*NN03*).

It was reported that the different administrations had had different approaches towards cooperation with non-government actor groups, especially environmental NGOs. It was reported that after the change of government in 2012, the Yameen administration established an unsupportive setting for NGO activities and democratic engagement in the country, which was a reason given for the decreasing role of civil society activities (*NN01, NN02*). The atmosphere for civil society groups during the Yameen administration was widely perceived as intimidating and unsupportive (*LN02*). For example, an NGO representative stressed that they were less vocal during the Yameen administration due to the arbitrariness of the administration and the lack of law and order at that time. The interviewee reported that there was political pressure on those who did not support the government's approach and associated their situation with the killing and intimidation of journalists and activists when Yameen was in office. The situation led him to pause the activities of the NGO with the aim of being inconspicuous. According to the interviewee, the assumption of the President's Office by Mohamed Solih ameliorated the atmosphere for the work of civil society activities, which is why he has resumed his environmental work with the NGO. He furthermore stressed the positive approach of the new administration towards working collaboratively with NGOs and other civil society groups (*NN07*).

On the local level, the collaboration between the city council, non-government organizations, and community groups was present. As the council has insufficient resources, staff, and expertise to coordinate and organize community meetings and surveys, non-governmental organizations in Fuvahmulah have conducted surveys and organized community meetings for and with the city council. An NGO representative in Fuvahmulah reported a good collaborative relationship between the city council and his organization. Even though they are not able to receive

## Assessing Local Adaptive Capacity of Fuvahmulah

financial support from the council, they are offered backings in the form of facilities and rooms (NN 06). Furthermore, the city council has been shown to collaborate with local groups in environmental projects, for example, by agreeing with the local surf association to clean up parts of the beach in return for the right to use a part of the beach (LG02). Also, the council has been responsible for organizing and coordinating with groups, such as the women's development committees, that have acted in ways to protect the coast from degradation (SII 071, SII 094).

The aim of the study was to examine how far the community can play a stronger role with regard to dealing with coastal problems and thereby enable the adaptive capacity on the local level. Thus, it was of interest to understand which actors might have the influence to get more community members involved in environmental projects, according to the participants. This finding helped to identify bridging actors between government entities and the community. First and foremost, the respondents of the survey named the activities of the local NGOs to be a catalyzer for more participation of community members in environmental and coastal protection activities. The NGOs have been shown to act as intermediaries between the community and the council, and/or the national government, as they have put effort into advocating for increased participation of the community in environmental governance. An example of an activity is the *Climate Change Adaptation Project (CCAP)* on Fuvahmulah, where the NGO GN Volunteers worked together with the project team in order to integrate the community in the planning and implementation of the CCAP. Activities included conducting community surveys on the importance of the wetlands for the people and a study on the willingness to pay for access to the wetland areas (LN04). Local NGOs, especially OneFuvahmulah, are increasingly organizing and implementing activities that integrate the community in the context of the coastal erosion issue. Their activities include monitoring the state of coastal erosion, replanting coastal vegetation, raising awareness of the problem, and educating the people on the cause of the problem and possibilities to combat the problem. The awareness-raising activities of the NGO include giving presentations in schools, organizing beach cleaning activities, and distributing flyers with easily understandable information on the issue of erosion for the general public on Fuvahmulah (LN03). Furthermore, OneFuvahmulah is not only trying to educate the people on the local level but also attempting to get the attention of national politicians by raising media attention through Facebook campaigns under the keyword *#SaveFuvahmulah*, which includes the mobilization of local community members. Another catalyzer for more integration in environmental activities is the mayor of Fuvahmulah, as the following statement shows:

“Actually, it’s because of the mayor. He is really into nature. He is going in that direction. Otherwise, I don’t think the city council would go in the direction that nature is a big issue for them. It’s because of the mayor.” (*SII 001*, 15).

Thereby, it was shown that the leadership of the local mayor has an encouraging effect on individual people of the community to get involved in environmental projects. Furthermore, it was shown that respondents believe that politicians have a lot of potentials to influence other community members to get them involved in environmental projects. This is illustrated by the various respondents stating that politicians must understand their role as role models and get involved in the activities together with the community, as the following respondent discussed:

“There is a problem that politicians invite to environmental protection activities, but the politicians never participate in it. They show up for five minutes and then leave again. They always leave. If they would stay, more people would do more. But this way, it shows that they only talk.” (*SII 089*, 32)

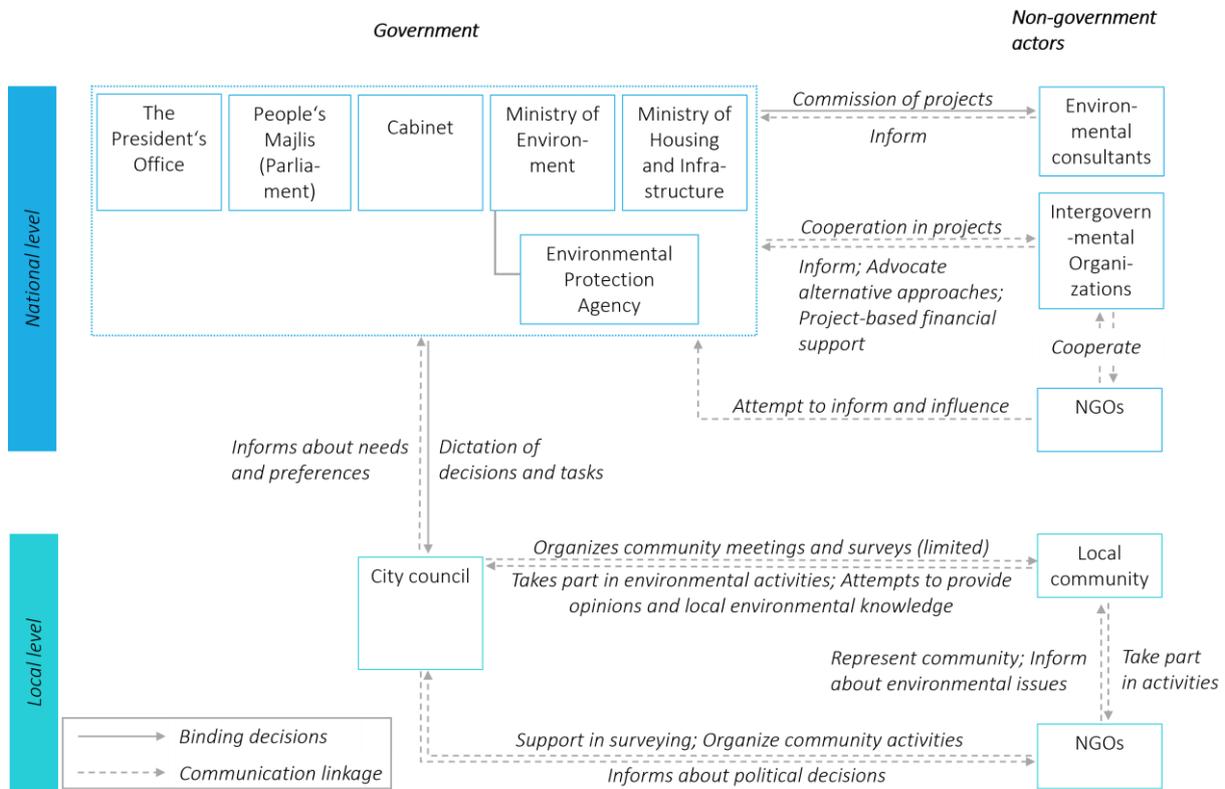
### **Key Enablers and Barriers**

It is assumed that adaptive capacity is higher when various groups are represented and interact with one another, horizontally as well as vertically (cf. part 2.1.4). Regarding the factors enabling adaptive capacity on Fuvahmulah, horizontal links on the local level seem to have positive effects for adaptive capacity, which were facilitated by bridging actors. This was illustrated by collaboration between the city council and the NGO GN Volunteers, and other community groups. The positive role of bridging actors was also identified on the national level by showing that especially NGOs and intergovernmental organizations have pushed for stronger involvement of communities across the Maldives. On Fuvahmulah, NGOs are looking at innovative ways to address coastal issues, which is an example of actors on the local level attempting to utilize new approaches with the aim of spreading that information to the national level.

A hindering aspect was that coastal governance was shown to be strongly coined by informal structures and processes. While formal legislations and regulations imply stronger participation of local-level actors and the community in decision-making processes, these are not followed by the powerful actors of the coastal governance system in the Maldives. The weak integration of the community in the decision-making structure reduces the local adaptive capacity in two ways: Firstly, decisions are made without including the knowledge and consent of the local level. And secondly, while the community has acknowledged the Decentralization Process and

perceives that it has more rights than before, its opinions are not integrated into the decision-making process, which leads to a feeling of distrust in the government entities.

Fig. 35 presents an overview of the key linkages that were identified in parts 5.3.3 and 5.3.4.



**Fig. 35: Overview of linkages between groups in the Maldivian coastal governance system (own illustration)**

### 5.3.5 Availability and Sharing of Knowledge and Information

The availability and exchange of information and knowledge among heterogenous groups are assumed to increase the adaptive capacity by leading to the consideration of the best possible measures and approaches to dealing with coastal issues, including innovative approaches (cf. part 2.1.4). The following part demonstrates how far information is available and how it is exchanged on and in between the levels on the Maldives related to addressing coastal issues.

Representatives of government organizations and non-state organizations have emphasized that knowledge on how to deal with coastal problems within the country is lacking depth, especially on alternatives to the common approach to coastal protection. Various reasons for this were discussed. Firstly, according to interviewees, expert knowledge on addressing coastal problems in the Maldives is highly concentrated on the national level. While reforms on the ministry level have led to the bundling of coastal protection expertise within the MEE – a positive and much-needed step forward as it allows thought out planning according to interviews on the national

level (NG02) – improvement of horizontal relationships with other relevant ministries such as the Ministry of Housing and Infrastructure or the Ministry for Tourism was seen as necessary (NN03). It has been argued that lacking horizontal relationships have led to low levels of sharing expertise and knowledge and resulted in low innovation levels in responsible authorities. Secondly, another reason for low levels of knowledge generation is that few resources are invested in research for dealing with coastal problems in general and in alternative approaches in specific. Interviewees reported a shortage of experts within government offices on the national level, which results in inadequate dealings with coastal problems due to missing local expertise (NN03). A result of the insufficient local expertise is that the country is highly dependent on external information of foreign experts and organizations, such as international engineering companies and development agencies (NG02). On a positive note, NGOs with the support of inter-governmental organizations are seen to be the main actors that develop novel ideas about alternative approaches, such as replanting mangroves or coral gardening (NN07, NN08). There is an attempt to generate local expertise on climate change adaptation and environmental planning at the Maldives National University in the course *Bachelor of Environmental Management*. Even though this course focuses on environmental protection in general, coastal problems play an important role in it. The university course is financed by the Ministry of Education and has been developed in cooperation with the MEE as well as international organizations such as UNDP Maldives (NN03). The introduction of the course is an example of the attempt to develop local expert knowledge that can be fruitful for future more local-based approaches to dealing with coastal problems in the Maldives. This is an example of a collaboration of various actors on the national level to develop expertise.

On the local level, no specialist knowledge on addressing coastal problems was found to be present in the city council office of Fuvahmulah. Yet, some specialist knowledge on climate change adaptation was identified on the island: Two trained environmental professionals working in the *Climate Change Adaptation Project* are permanently located in Fuvahmulah. However, their expertise is rarely tapped into, as their duties – assigned to them by the MEE – are limited to bureaucratic tasks (*Fieldnotes*, 2/13/2019). On top of this, only one research document on the coastal zone and coastal issues on Fuvahmulah is available, namely the environmental impact assessment report for the planned revetment, which is publicly accessible (MEECO 2016). The environmental impact assessment has been conducted to understand the environmental impacts of the planned revetment on the east coast by Maldives Energy and Environmental Company and the Dutch engineering consultancy firm Royal HaskoningHDV. Also, on the community level, NGOs and schools have shown to be active in knowledge and

information distribution on the local level regarding coastal issues to the community members (*LC01*). Firstly, the NGO OneFuvahmulah has been focusing on raising awareness on the erosion issues by distributing leaflets that inform the people of the island on the topic of coastal erosion (*Fieldnotes*, 2/4/2019). And secondly, schools have presented themselves to be highly effective in Fuvahmulah regarding the spreading of knowledge about coastal ecosystems and their coastal protection services and are an important bridging actor between the community and the national level. Programs developed by the MEE together with the Ministry of Education have shown to be effective in teaching students as well as their parents about coastal ecosystems services. Numerous parents of school students that took part in the survey reported having learned a lot about the coastal environment and the vulnerabilities of their island through the schoolwork of their children. This is exemplified by the *Farukoy Project*, which was viewed as successful in distributing knowledge on the importance of reefs by respondents (*SII 002*, *SII 020*). The project encompassed taking students on snorkeling trips on their house reefs to let them discover their natural surroundings and to teach them about the services the environment provides. The project was a cooperation between NGOs, the MEE, and the Ministry of Education (*NN08*). This is a positive example of vertical cooperation among the ministries and how it can positively influence the community level by increasing awareness. Further vertical relationships regarding knowledge exchange were lacking. In general, experts stated that there is little exchange of information between the MEE and the councils on the islands regarding coastal issues (*NN02*, *NN03*). However, there have been attempts to establish vertical links to exchange information among government entities on the various levels. For example, the MEE has made an increasing attempt to institutionalize knowledge on how to address coastal issues through publications and make the knowledge accessible for a larger group of actors on the different levels, which was discussed in part 5.2.1.

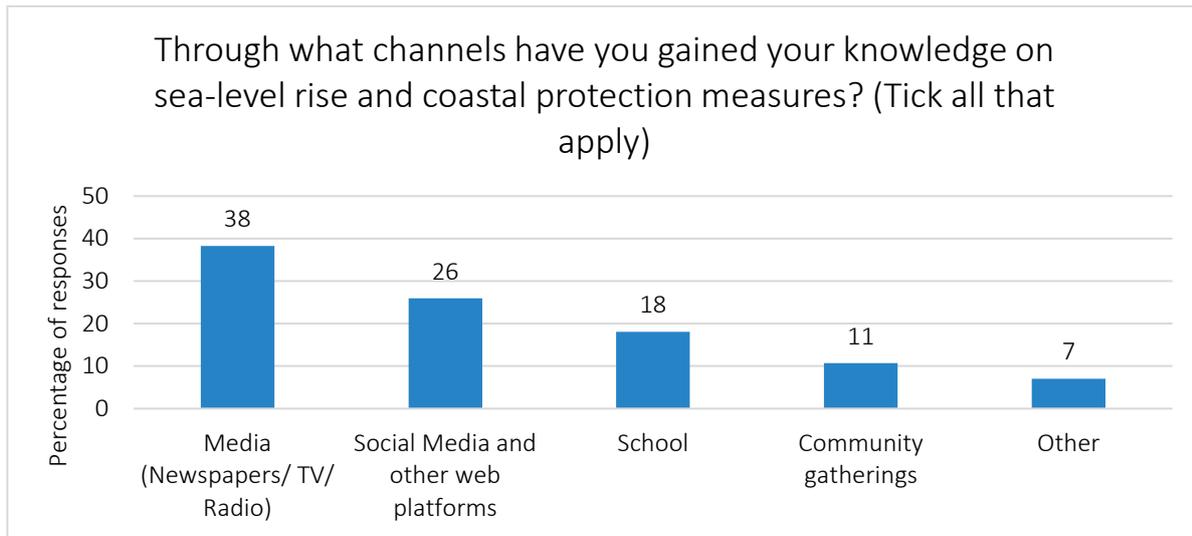
Knowledge and information exchange between the community and decision-makers is lacking in both directions. For one, based on the results of the household survey, community members on Fuvahmulah felt that there has been insufficient attempt to inform them about coastal issues and how these should be dealt with. According to the household survey respondents, little information has been distributed on the causes of the island's erosion and about the plans to battle the coastal erosion problems by the responsible authorities. Most of the information they have been able to gather was distributed through informal links with local politicians and discussions among community members (*SII 001*, *SII 036*). It was of interest to understand where people derive their knowledge about sea-level rise and coastal protection measures from in more detail, as it provides an understanding of the flow of information. The basis for this was a closed-ended

question about the channels through which the interviewees acquired their knowledge on the topic. Media, such as newspapers, TV, and radio, was the most important source for information (38 percent of 243 mentions), followed by social media and other web platforms (26 percent) and school (18 percent). The answer “community gatherings” was only given as an answer by a small group (11 percent). Those that chose “other” (7 percent) included statements saying that they have gained experience by observing the environment or because they have worked at a resort, where they learned about coastal protection (Fig. 36). Interviewees furthermore stressed the importance of social media for their activities, including the distribution of information and the organization of events by the NGOs on Fuvahmulah.

Numerous community members have demonstrated interest in being better informed about environmental problems and the plans on how the problems will be addressed (*SII 061, SII 075, SII 080*). Secondly, the community members stated that there is lacking interest in taking their suggestions and opinions into consideration by the responsible authorities. One respondent stressed:

“Very little is done with the community. What is done is that the project will be given to a company and they will do the project and those things. (...) That is the main reason why the people are not thinking about the environment. It is from the government’s side – they are not taking the opinion from the community.” (*SII 030, 32*)

Some respondents of the survey have demonstrated to have relevant knowledge about the coastal environment of Fuvahmulah, for example, about the importance of the coastal vegetation or the dynamic processes around the island. Numerous respondents stated that the integration of their opinions and knowledge into the decision-making in the context of environmental projects would be beneficial for the island (*SII 006*). The statements of the community members have been confirmed by non-governmental actors on the national level that argued that local knowledge regarding the environment is not integrated into decisions regarding coastal protection planning by the responsible authorities (*NN03, NN07, LN05*).



**Fig. 36: Channels used to obtain information (n=116, no. of responses=243, structured question, multiple responses possible)**

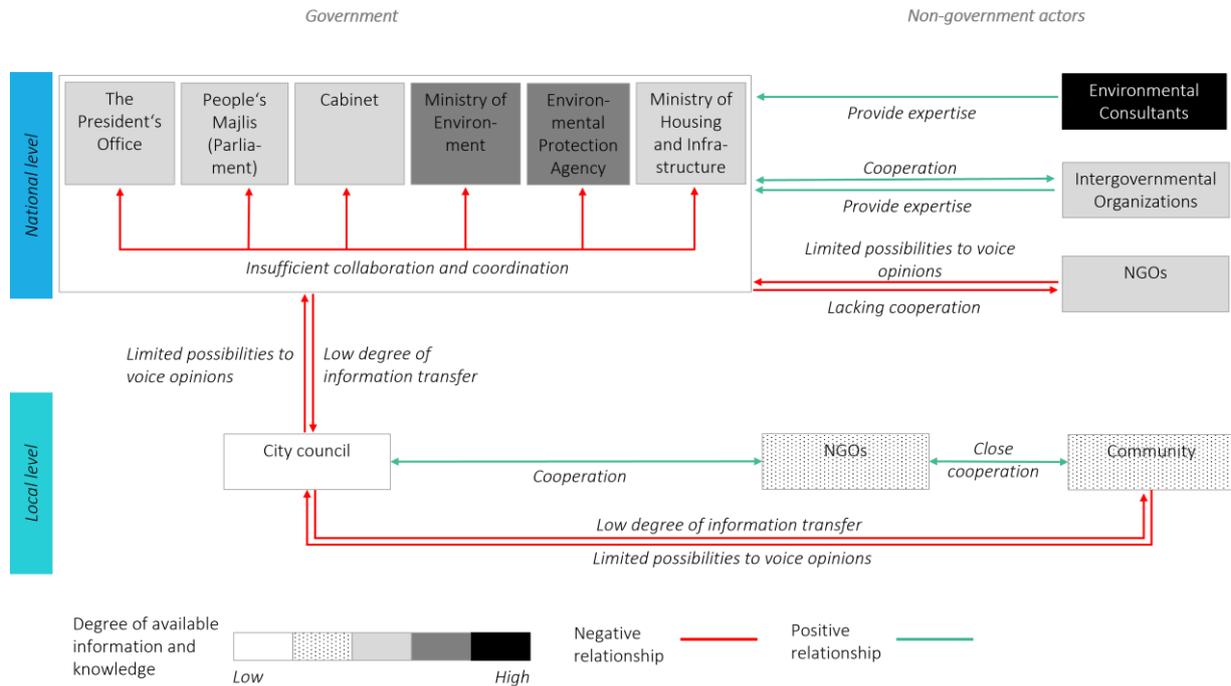
### Key Enablers and Barriers

Enabling factors regarding the access to and sharing of knowledge and information include fairly strong linkages on the local level. Strong links were identified within the community, as well as links between the NGOs with the community and in limited ways with the city council. NGOs are increasing the distribution of information which allows stronger sovereignty of the lower levels. On the national level, there have been some attempts to distribute knowledge on dealing with coastal problems to lower levels of government through guidance documents that have been published by the ministries. The development of local expertise can be seen in the development of university courses that have to be highlighted as a positive development with regard to developing local-based knowledge on how to deal with issues concerning the coast.

On the constraining side, knowledge on coastal protection is highly centralized in the national governing bodies and is insufficiently shared through vertical and horizontal linkages. The amount of available information is widely seen to be insufficient, and little research has been done on the national level that can foster the development of alternative approaches to dealing with coastal problems. The domestic expertise on the local level is limited. Therefore the dependence on international consultant companies and international organizations is significant. On the local level, the little environmental expertise that is available is not taken advantage of, which is a large problem as approaches that are adjusted for the specific situation at hand are not developed. In summary, the conditions regarding access to information and information distribution must be seen as hindering for Fuvahmulah. Firstly, the needed information for dealing with coastal problems is not available. And secondly, knowledge and information sharing

## Assessing Local Adaptive Capacity of Fuvahmulah

are insufficient as the different actors and levels are not linked well, which reduces the likeliness of developing new ideas (Fig. 37).



**Fig. 37: Knowledge availability and linkages between groups (own illustration)**

### 5.4 Community Characteristics on Fuvahmulah

As proposed in the analytical framework, next to the governance variables that influence local adaptive capacity, it was of particular interest to understand characteristics of the community that enable or hinder local adaptive capacity and how this is influenced by the sociopolitical context. Two steps are taken to understand the characteristics of the community on Fuvahmulah that are seen to influence the capacity to adapt to coastal issues. In a first step, the community structure and the social cohesion in the community of Fuvahmulah are analyzed. In a second step, the focus is on the community members' relationships to the place they inhabit.

#### 5.4.1 The Relationships in the Community

The types of interactions and relationships and the degree of trust among the community members are characteristics of a community that enable or constrain adaptive capacity as they are fundamental for cooperation in the pursuit of common goals on the local level. In the following part, it is assessed in how far these factors are manifested on Fuvahmulah.

Aiming to get a better understanding of who the people consider to be part of their community and understand the relationships on the island in more detail, the questionnaire included the open question who they perceive to be part of their community. Most interviewees (59 percent of 111 mentions) perceived all the inhabitants of the island as their community and explained

that the island is small and most people on the island know each other. Some participants, however, argued that they consider smaller entities to be their community, including the neighborhood (19 percent) or family (11 percent), among others. However, interviewees on Fuvahmulah reasoned that the social circles of the people on Fuvahmulah have become smaller in size as a result of worsening relationships among the community members.

To obtain a better picture of the community's social structure, it was of interest which social group the respondents have the closest ties with. Consequently, the questionnaire included a structured question of who the interviewees would call first if they had some kind of emergency. Almost 9 out of 10 respondents stated that the first group of people they would contact is the "family" (87 percent of the respondents), followed by "friends" (7 percent) and "neighbors" (3 percent). "Other" (3 percent) included one mention each of the following institutions: council members, government organizations, or the police (Fig. 38). "Religious community" was not chosen by any interviewee. All in all, the respondents stressed that the relationships within families are the most pronounced, but another question revealed that even though links with other community members have weakened, there was mutual trust among the inhabitants of Fuvahmulah. Asked in a closed question if the people of the island can be trusted in general or not, a large majority of people (82 percent of the participants) have the feeling that other community members can be trusted. Only about one in five of the respondents believed that they must be careful when dealing with people (18 percent; one percent answered "don't know"). As trust is highly important for collaboration, these responses indicate that people are likely to be able to work together with other community members on Fuvahmulah.

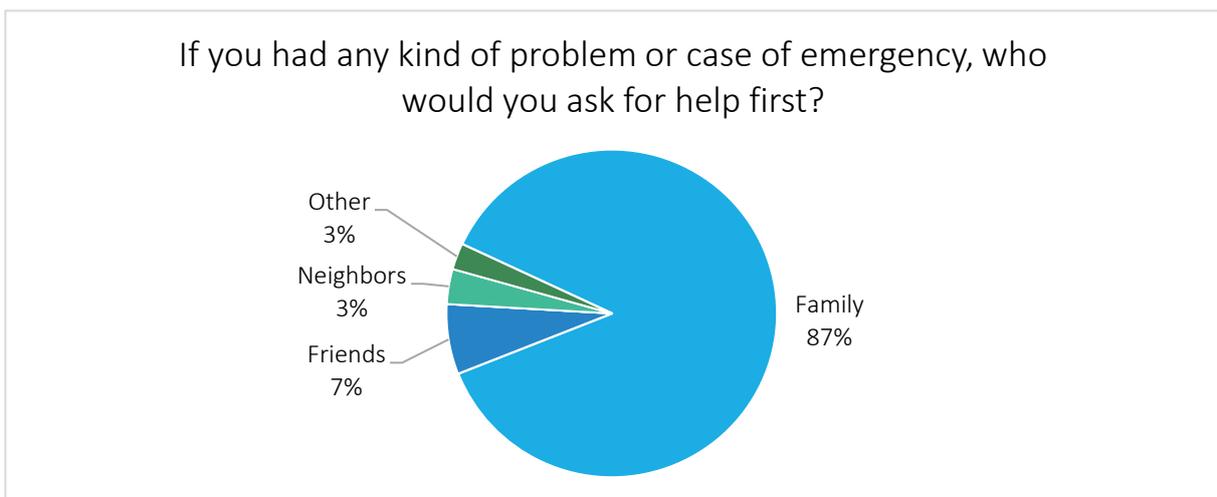


Fig. 38: First to contact in case of emergency (N=116, percentage of respondents, structured question)

## Assessing Local Adaptive Capacity of Fuvahmulah

As discussed in part 2.2, the quality of relationships in the community is important for cooperation. Asked in an open question to describe the community life, a majority of the respondents (53 percent) gave positive responses. These highlighted the good bonds between the individual community members and that they help each other out in times of need. In detail, they discuss that cooperation is good with the people on the island and that there is the willingness to aid one another when needed, as the following statement shows:

“It’s good. It’s good, people are very cooperative. Since we are small, everybody knows each other and then help in situations like in deaths and everything.” (SII 023, 7)

Numerous respondents based their statements on past examples. Especially older survey participants stressed the large support between community members in the past. For example, three men separately stated that when new *dhonis* (English: boats) were built by one household that the neighbors would support them with cooked food. A former ward council reported on the construction of a large ship that needed to be transported to the coast, in which dozens of community members helped pull the boat. Others pinpointed the good relationships by describing how people shared dinner with their neighbors as a regular event.

In contrast, a number of people stated that they characterize the relationships between the people as in mediocre condition due to the decrease of the quality of the relationships in the community in recent years (28 percent). In line with this, another group stated that they think that the relationships between the people are in poor condition (9 percent). Two percent described community life without any valuation, and five percent of the statements in the survey were inconclusive, or the respondent did not have an opinion on the matter (Fig. 39).

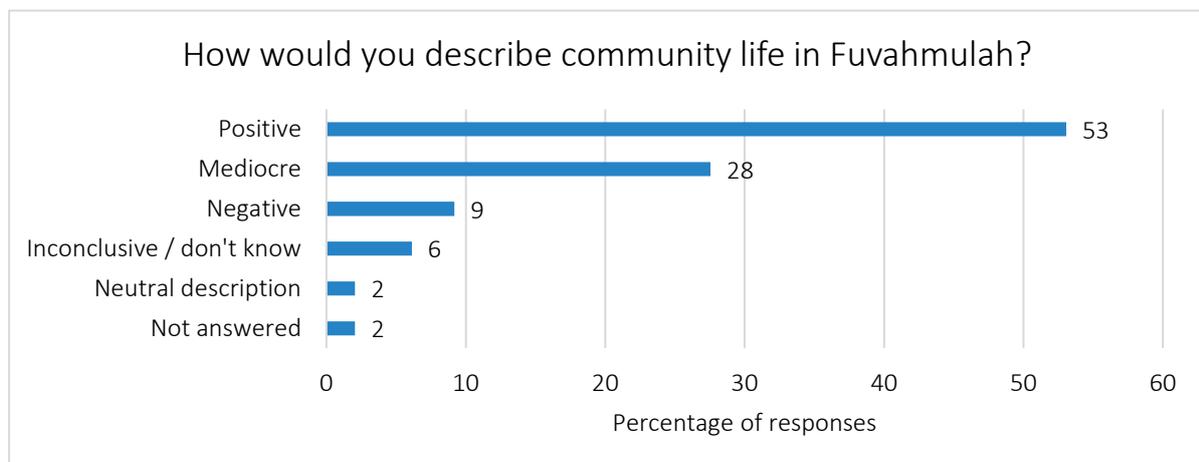


Fig. 39: Evaluation of community life on Fuvahmulah (n=96, open question, categorized)

## Assessing Local Adaptive Capacity of Fuvahmulah

A number of aspects were named by the participants that have led to the worsening of bonds between the community members on Fuvahmulah: The political situation, especially the introduction of the party system, was named most often by respondents. The negative impacts of the introduction of democratic principles in the country are highlighted by the following statement that contrasts the current situation with the community life before the democratic reforms (Fig. 40):

“Before, there was a good community life. When building a dhoni, neighbors would be helping each other. Also, with cooking, people invite each other over. Also, no money was needed. After 2000 and 2004, nobody is visiting the houses of each other. Less talking with each other in the neighborhoods. I think it’s because of the introduction of democracy. I was against it. No good for a small island population. Saw the negative effects in India. A lot of people are fighting between parties. Even now with friends, if you don’t support the same party, we fight.” (*SII 097, 7*)

Another participant argued that the divisive political situation has led to a decrease of trust, as the following statement stresses:

“Relationships are not that good at the moment. There are some problems – the changes in the lifestyle are really changing a lot. Mostly the political problems are causing these problems. There is less trust between the people and more discussions” (*SII 081, 7*)

According to the respondents, other aspects that have negatively affected the quality of the relationships included a general change of the lifestyles on the island, which was associated with the introduction of money and employment on the islands. The deterioration of the quality of the relationships has been identified as the respondents see less sharing of goods and food, and there is less time spent with other community members (*SII 041, SII 090*). Furthermore, the increasing consumption of drugs and the rising crime rate are identified as further reasons for weakening bonds (*SII 031, SII 037*). To illustrate the degradation of community life on Fuvahmulah, one former chief reported that in earlier days, the Friday prayers only took place in one mosque on Fuvahmulah, in Raaskefaan. That meant that all men got together for lunch after the prayer and discussed topics concerning the island, which has ceased today (*LG06*).



**Fig. 40: Residential buildings in Fuvahmulah in the colors of the two rival political parties (Yellow/MDP, Pink/PPM). The color for the houses is sponsored by the political parties (own photo, 2019)**

Investigating how community members are affiliated with clubs and organizations provides an understanding of the likeliness of the inhabitants to take part in organized activities on the island. Therefore, it was of interest to see how far the respondents are organized in any kind of clubs or associations. Generally, there is only a very low level of activity in clubs or associations. Most participants are not involved in any sort of club or organization (72 percent of the participants). Those respondents that are active (28 percent) participate in a club or association-sponsored activities that are associated with these categories: “sports clubs” (29 percent of those respondents that are involved in a club or organization), “national or international non-governmental organizations” (14 percent), “religious community” (12 percent) and “local environmental groups” (10 percent). Organizations that organize environmental protection activities from time to time included: GN Volunteers and the International Red Crescent. The category “other” was named by 29 percent of the respondents, where interviewees mentioned participating in beach cleanups that were taking place irregularly, and another group mentioned they are members of a youth association. An interviewee stated that a low number of memberships in clubs and organizations is typical for the Maldives, as people are not interested in long-term memberships and are keener on participating in events on an irregular basis (NN04, LN04).

### **Key Enablers and Barriers**

In respect of the community relationships at the local level, some characteristics have been shown to be able to enhance adaptive capacity. For one, a general feeling of trust among the

community members and a mostly positive assessment of the relationships within the community were found. These factors can be assessed as a potential foundation for collaboration. However, constraints were clearly shown as people have argued that mutual trust has noticeably deteriorated on the local levels in the past decade. The degraded trust was primarily traced back to the influence of the conflict between the two major political parties on the national level. Concerning adaptive capacity, the conflict has already shown that community members are likely to work less with supporters of the opposing party. Consequently, community members are less likely to collaborate in groups for a mutual cause on the local level. This also means that people are less likely to meet up at meetings and share information together, as they are uncertain that all people are willing to work towards a mutual goal for the island.

#### **5.4.2 People's Relationships with the Island and the Coast**

In the following part, the relationship of the people towards the place they live in is scrutinized. Strong place attachment is assumed to lead to a higher degree of adaptive capacity. The conceptual strategy was first to understand how the respondents perceive their island and coastal areas and what features they value most to derive from these perceptions if the coast is worthy of protection in the respondents' perception.

To investigate what features of Fuvahmulah are valued by the interviewees, an open question asked how the respondents would describe their island to a friend or a visitor. The interviewees mentioned tangible and intangible values associated with the environment, ranging from subjective impressions of past and present experiences to physical elements of the landscape. Aesthetic and emotional values were the most frequently named aspects that were used to describe the island: beautiful (15 percent of 269 mentions) and uniqueness (12 percent) were the two most stated associations with Fuvahmulah. The associations were often mentioned in one sentence by the respondents. The following quote from an interviewee delineates the latter-named aspect:

“Very unique island. Atoll with only one island. (...) So many unique places:  
Two lakes, marine beauty, no nearby inhabited islands" (*SI 028*, 8).

The third most often stated response was the emphasis on the friendliness and hospitality of the island's inhabitants (10 percent). Additionally, an aspect that is seen to characterize the island for the interviewees is that it is “green” (5 percent) as well as the nature of the island (5 percent). Looking at the natural environment in more detail, specific elements that were mentioned most

often were: “thundi” (4 percent), “beaches” (4 percent), the “lakes” (3 percent), and the wetlands (2 percent). In more detail, Fuvahmulah is known nationwide as one of the country's most beautiful islands due to the above-named elements of its environment. It is widely spread in the country that the inhabitants of Fuvahmulah are proud of these unique characteristics (*NN01*, *NN02*).

A following open question, which emphasized the nature of the island, asked what elements of the natural environment were most important to the respondents. Elements of the natural environment that were mentioned are related to the land part of the island (48 percent of 235 mentions) on the one hand and the coastal zone between land and sea (33 percent) on the other. Looking at the land elements, first and foremost, the flora (32 percent) is of great importance for the interviewees (the elements of the transitional zone between land and sea are discussed in 1.2.). Numerous mentions are summarized under the category “flora”, while the general term “trees” was used most frequently (17 percent). Other mentions included in this category are specific types and categorizations of trees, namely “coconut trees” (4 percent), “large trees” (3 percent), “mangroves” (2 percent), “mango trees” (1 percent), and “wood areas” (1 percent) amongst others.

The flora was described primarily as beautiful and unique when compared to other islands, which was ascribed to its high diversity. Additionally, numerous trees and plants are not only valued for their appearance but are also seen as crop plants. One respondent gave an insight into how the greenery is defining for Fuvahmulah:

“We have green around our island, and there is no island like this. Plenty of trees, and ponds.” (*SI 002*, 10)

Other important elements of the natural environment associated with the land area of the island are the two freshwater lakes (8 percent) in the wetland areas (5 percent), which are also addressed in the quote given above. Similar to the greenery on the island, these areas are seen as something unique for the Maldives and are popular as a swimming spot as well as for other activities, such as going for walks and for mud diving. Interestingly, when asked for their perception of important environmental features of Fuvahmulah, numerous interviewees talked about environmental problems (4 percent), such as the cutting down of trees or contaminated groundwater.

### Relationship with the Sea and Coast

The second category of responses to the open question, which natural elements of Fuvahmulah are important, encompasses the coastal zone (33 percent of 235 mentions). This category includes the mentions “beach” (8 percent), “reef” (6 percent), “sand” (6 percent), “thundi” (4 percent), and the “coast” (4 percent). On a similar note, the terms “the sea” (2 percent) or “ocean” (none) were rarely or not mentioned, indicating that the sea itself is not understood as an integral part of the environment of Fuvahmulah. In order to understand the relationship between the respondents with the sea in more depth, an open question asking how they interact with the sea was posed. The respondents generally did not only reference the sea in their answers but also included the beach and the reef. Due to this, these three aspects are discussed jointly in the following. Even though it was not asked directly, about one-third of the interviewees included the frequency of their interaction with the sea and coast in their answer. More than one out three of these interviewees (36 percent) stated that they interact with these more than twice a week; 22 percent of interviewees answered that they go there approximately once a week, and 27 percent less frequently than that. 15 percent of the respondents stated that they never interact with the sea (Fig. 41).

Primarily, recreational activities are important for the interviewees, focusing mainly on “swimming” (23 percent of 197 mentions), “fishing” (7 percent), and “snorkeling” (6 percent). Secondly, the beach and coast also represent an important social space for families and friends to get together. This is shown by the numerous mentions of “hanging out” (5 percent), stating that they visit the coast with their family (5 percent), and the high popularity of picnics on the beach

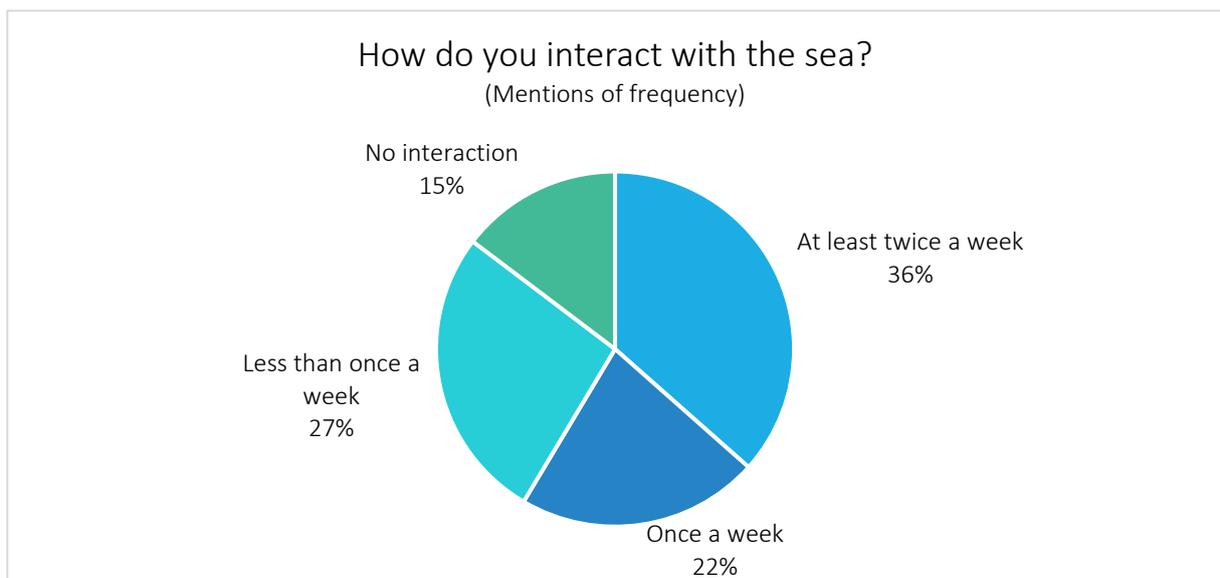


Fig. 41: Frequency of interaction with coast or sea (n=41, open question, categorized)

## Assessing Local Adaptive Capacity of Fuvahmulah

(4 percent) (Fig. 42). A smaller group also makes use of the coast and sea as a space for commercial activities, such as commercial fishing (2 percent) or as a swim instructor (1 percent). One interviewee summarized the importance of the sea the following way:

“We feel happy when we see it. And also, we get food from the sea. It's a part of us.” (SI 062, 9)

Other categories focus on the aesthetics of the coastal area and their emotional bond to the ocean, calling it beautiful (6 percent) or important (4 percent). The statements underline the widespread notion of the close relationship of the people with the sea, which is furthermore underlined by an idiom that states that the people of the Maldives are “people of the sea” (*Field notes, 03/20/2017*). Next to the recreational, social, and commercial roles, the coast also has other functions: Interviewees mentioned the protective function of the coastal zone for Fuvahmulah (2 percent) when discussing the important elements of the environment. Due to the bowl-like structure of the island, people believe that they inhabit a safer island compared to other islands. Some also mentioned the protective functions of the reef, one interviewee saying:

“Most important is the reef. What I'm saying is that we are protected by the reef. It's not like the others [islands in the Maldives] that are protected by more islands in the atoll” (SI 080, 10)



**Fig. 42: Social gathering on thundi (own photo, 2019)**

Even though some respondents were discussing and highlighting the importance of the coastal ecosystem services, an NGO representative on Fuvahmulah noted that people are not highly

knowledgeable on the ecosystem and its services and take these for granted. On another note, the coast is also perceived as a dangerous place (5 percent) by the interviewees, especially due to the large waves and the strong currents, which was also argued to be a unique feature of Fuvahmulah (Fig. 43). Numerous interviewees had specifically reported that they do not swim in the ocean due to the waves (3 percent), and others had reported problems that boats had had when entering the island before the harbor was opened in 2003.

### Key Enablers and Barriers

An enabling factor of adaptive capacity regarding community and its relationship to the place is the high degree of attachment the people have demonstrated towards their island. People have discussed *their island* by highlighting terms that show how unique the island is for them and stressed the importance of the coastal for various activities. Some community members have shown to have specific environmental knowledge about the island, particularly about the coastal protection services. Based on these findings, it was shown that people are interested in protecting the island from further coastal degradation due to the high emotional attachment and the knowledge they have about the importance of the coast for their future on the island.



Fig. 43: Monument commemorating drowning victims on Fuvahmulah (own photo, 2019)

## 6 Understanding the Influences on Local Adaptive Capacity

The main aim of this thesis is to analyze how local-level adaptive capacity has been enabled or hindered by the multi-level governance system and the sociopolitical context it is embedded in. Adaptive capacity is required for dealing with change and uncertainties, which is gaining importance in the face of growing stresses on the environment. In the face of underwhelming approaches to adapting to coastal changes on small islands in the past, demonstrated by increasing vulnerabilities of coastal inhabitants around the world and especially on SIDS, the need for more local-based approaches was put into the focus of this work. Local adaptive capacity can be seen as enabling or hindering the implementation of an alternative, a more local-based approach to addressing coastal challenges. On the basis of the analytical framework – focusing on the individual and organizational understandings, social organization, and community-specific aspects – the following part discusses the factors that have enhanced or hindered adaptive capacity on the local level in Fuvahmulah.

### 6.1 Enablers to Local Adaptive Capacity

Actors on all levels and the local population in the Maldives were highly aware of the coastal erosion problems and associated issues. For this island country, it was shown that the people have a history of dealing with coastal issues, which has led to a heightened sensitivity towards the issues and to an understanding that the coastal problems need to be acted upon. Among all groups on the two investigated levels, the national and local level, the understanding was shared that the erosion on Fuvahmulah as well as the associated risks were recognized as an urgent problem. The feeling of urgency was furthermore strengthened by the strong emotional bonding the people of Fuvahmulah feel for the island: especially the coast is a place of high cultural and social value for the islanders, which has been shown to reinforce the interest to protect it (*Amundsen* 2015). This became most evident when interviewees stated to be interested in securing their and coming generations' future on Fuvahmulah. The importance of protecting their future on Fuvahmulah is also reflected in the strict opposition to resettlement considerations of islanders found in other studies in the context of the Maldives (*Stojanov et al.* 2016, *Kothari* 2014) and other SIDS (*Connell* 2016).

The strong emotional connection of the people towards the island and its coastal environment is linked to a high degree of interaction with these elements and leads to local environmental knowledge that the people possess. The knowledge helps them understand coastal erosion processes and how to address them. Specific knowledge about environmental processes allows the development of behaviors and actions that enable the response to perceived and/or observed

environmental changes (*Bomhauer-Beins* 2019). Its presence can also be partly traced back to the high education level of the islanders. Another important effect can be attributed to bridging actors as they significantly contributed to increasing the knowledge on environmental issues and regarding novel ideas on how to address coastal issues on Fuvahmulah (cf. *Ireland* and *Thomalla* 2011). Likewise, individuals who have worked on resorts are on record as bridging actors. They have learned about the values of coastal ecosystems and have transferred this knowledge to community members on Fuvahmulah.

The identified available knowledge on the coastal environment and specifically the coastal protection services was linked to two important aspects in the context of the local adaptive capacity on Fuvahmulah: It was revealed that numerous community members attribute the erosion problem on Fuvahmulah to anthropogenic influences. Thus, many are aware of the negative effects that human interferences have on the protective function of the coast. In consequence, an enhancing factor for adaptive capacity is that community members on Fuvahmulah show awareness that their actions and activities can have negative as well as positive effects on coastal issues – making it likely that community members can get mobilized to act on the problem. This finding is of significance as it has been shown that people only act in adaptive ways when they believe that their actions can have positive effects (*Ajzen* 1991). The situation on Fuvahmulah is unlike the observations by *Ratter* et al. (2016), who found that people in a similar situation on the Comoros lacked the insight that their sand mining activities caused erosion. In the Comoros case study, the inhabitants adopted the government's argumentation and attributed the coastal erosion issue to climate change effects, which led the people to be unwilling to change their behavior as they perceived the issue to be beyond their control. The comparison of the results of the two cases highlights the adaptive capacity on Fuvahmulah.

The second aspect related to the widespread knowledge on coastal protection services was that the islanders showed openness towards locally implementable soft coastal protection measures. The people understand and know of the protective functions of the natural coastal elements, such as the coral reefs and the *heyli*, and therefore showed support for soft coastal protection measures that are based on or work in harmony with the elements of the island's coastal environment. The results demonstrating the openness towards protection measures was surprising to actors involved in the governance system (*NN05*) and contradicted the findings of other studies (*Sovacool* 2012).

Apart from the effects of knowledge on the local capacity to adapt, the influences of important political leaders on individuals and groups to become active were found to be significant. A

few individuals on the national level, such as former President Nasheed and others on the local level, including the mayor of Fuvahmulah, proved to have enhanced local adaptive capacity through their work. They succeeded in raising awareness and interest in the community regarding coastal issues by showing how to address them collectively. In more detail, discourses that leaders utilized in the past have been shown to act as motivators for people to organize in groups and commit themselves to environmental tasks. It became clear that Nasheed's message promoting inclusiveness and democratic participation led to stronger interest and fostered community-based activities. Nevertheless, it would be naïve to view the environmental actions during the Nasheed administration as entirely positive. Domestically, the administration's actions were criticized for adding to the social divisiveness (cf. part 4.2.2). However, this research demonstrated that the administration's approach to addressing environmental issues mobilized a wide range of Maldivians and transported the feeling that their activities matter. In sum, leaders have a unique role in opening up new avenues to environmental governance, facilitating relationships and partnerships, giving direction, and enabling the exploitation of opportunities. They are also in a unique position to garner support and make resources available (*Westley et al. 2013, Engle 2011*). Interestingly, religious actors and organizations were not found to play a role in this context in the Maldives.

The respondents understood the local level to play an important role in addressing coastal problems and assessed the role of the community as an active participant. The people of Fuvahmulah argued that they understood that the role of groups on the local level had gained importance due to the redistribution of rights and responsibilities in the wake of decentralization measures as well as the associated discourses in the country. Laws and regulations, such as the *Decentralization Act of 2010* and the *EIA Regulations*, have been important milestones for a stronger involvement of the local level governments and for community involvement on paper. Accordingly, it was shown that the formal organization of addressing coastal issues is supposed to be increasingly inclusive of lower-level government, non-government actors, and affected communities. This redistribution of authority according to the *Decentralization Act* has been acknowledged and accepted by the community members, which was underscored by results of the empirical data: People on Fuvahmulah see the local level, i.e., the local government as well as the community, as the principal actors with regard to being responsible for the development of the island and the protection of the coast. Most importantly, their belief is that decisions regarding coastal development would be more thought-through if community members were included in the planning and decision-making process. Some community members have specifically stated to have become active in activities dealing with coastal problems because of the

lacking willingness to act on the part of national government actors. This lack of trust in the responsible actors and the confidence in their own abilities, based on the experience and the shared knowledge with regard to coastal issues, clearly demonstrates the interest in addressing coastal issues on the local level.

The results revealed that many people on Fuvahmulah have taken part in activities that aim at protecting the coastal ecosystems, for example, participating in beach cleaning or tree planting events. Such actions demonstrate that people understand the potential negative impacts of anthropogenic activities on coastal ecosystems and are aware of the vulnerability of the island. The high degree of emotional attachment to the island was identified as a motivating factor to be involved in activities, which has also been identified in other studies regarding adaptation to coastal issues in the Maldives (*Stojanov et al. 2016*) and elsewhere (*Karlsson and Hovelsrud 2015*).

Bridging actors played an important role in planning and organizing activities as well. One particularly positive example to note regarding local adaptive capacity is the collaborative relationship between the city council of Fuvahmulah and the NGO GN Volunteers, as it generated community involvement where it would not have been possible due to lacking resources of the city council (Fig. 44). A further study has shown that lacking financial and human resources in government agencies reduce the likeliness of community members to get involved in the planning of environmental projects (*Nadeem and Fischer 2011*). As a consequence of the collaborations on Fuvahmulah, the community members' ability to counteract the risks of coastal hazards was strengthened. In other words, local adaptive capacity is enabled through increased island-based organizational capacities based on horizontal links.



**Fig. 44: Identified functions of bridging actors (own illustration, after *Berkes 2009*)**

## 6.2 Barriers to Local Adaptive Capacity

A significant finding from the investigation is the revelation of how the largely dysfunctional political situation in the country has acted as a barrier to local adaptive capacity on Fuvahmulah. In particular, three aspects of the sociopolitical context need to be stressed: the Yameen administration's style of governing, the lack of a clear political vision, and the divisiveness stemming from the rivalry between the two main political parties. Another identified barrier is that alternative and novel approaches to dealing with coastal issues are unlikely to be developed and implemented due to institutional deficiencies. The following part delves into these aspects and discusses their effects on the local adaptive capacity.

The Yameen administration's approach to governing was shown to have created a negative environment for a stronger involvement of the local level groups as well as NGOs in questions regarding the development of the islands in general and particularly in the coastal context. Especially the negative influences of centralistic and hierarchical structures on the local capacity to adapt were disclosed. While the limited existing formal institutions such as the *EIA Regulations* and the *Decentralization Act* were supposed to provide leeway for local action in the legal framework, the "rules in use" (Ostrom 2015, 47) of coastal governance in the Maldives were shown to be dominated by a few actors on the national level. It was shown that the ministries at the national level and associated government entities have remained to be the most important actors, with decisions being made in a top-down fashion.

In this regard, the scrutiny of the formal institutions revealed that the limited legislation in the context of addressing coastal problems in the Maldives is a hindrance for empowering the local level. The existing legal documents are generally phrased in vague terms, which has shown to free the national government from being held accountable and offers only limited legal recourse and guidance for lower-level government actors as well as non-governmental organizations. While the formal institutions dictate a stronger involvement of the local level government and the community, lacking allocation of rights and responsibilities to the lower levels of the governance system was observed. Instead, it became obvious that the national-level government actors prescribe the rules and norms that shape coastal governance based on their powerful position. The actions by the national government led to the exclusion of the actors and groups on the local level. Interviewees claimed that this lack of redistribution of authority to the lower-level government was due to the interests of the political elites within the Yameen administration to keep the authority centralized (NN02, LN03). As a result, the local level government was

shown to lack authority and thus had only weak administrative capacity, underlining the dependence on the national government. The situation has influenced how the groups on the local level assessed their abilities to cope with the changing environment. Specifically, the city council felt dominated by the national government and restricted to a petitioning role.

On another note, community participation was assessed to be insufficient by community members as well as NGO representatives. Based on the survey results, there were severely limited possibilities for formal participation of community members in questions of how coastal issues were dealt with: large parts of the community were dissatisfied with the current approach and skeptical about the mechanisms that have been established for the involvement of the community. Fuvahmulah inhabitants felt left out of the decision-making process and stated that the flow of information both in the top-down direction and vice versa was impaired. In more detail, the top-down information flow was criticized by the survey participants stating that there was insufficient access to information on environmental issues in general and on the planned measures to combat the coastal issues. To illustrate, the survey showed that community meetings were not taking place. This is problematic as these meetings have been identified as being important for raising awareness, which in turn increases the likeliness of adaptive behavior (*McNamara 2013, David et al. 2013*). It is a barrier to local adaptive capacity that Fuvahmulah's community members widely perceived themselves as not being in a position to influence the development of the island. However, the feeling of empowerment is important when working towards a shared aim. The results are in accordance with a study of the EIA process in the Maldives by *Zuhair and Kurian (2016)*, who identified bad conditions for purposeful democratic participation in the EIA process due to procedural and socio-economic barriers that led to shortcomings in sustainable development. Amongst other aspects, they revealed that meetings during the EIA report preparation phase were often not open to the general public. Also, notice of the meetings was only given shortly before the scheduled start time. These factors made it difficult for the councilors on the local level as well as the community members to participate in the meetings. Furthermore, they have identified a lacking two-way flow of information in the EIA process in the Maldives. They have shown that in nine of the 12 analyzed EIA processes, the EIA consultants only gathered information from the community and did not reciprocate by informing the community about the project or its implications, thus seriously curtailing social learning processes (*Zuhair and Kurian 2016*).

In this case study, the lack of information and knowledge distribution manifested itself in how the community members understood climate change and coastal changes. The results of the

study have shown that while the coastal erosion is seen as an immense risk for Fuvahmulah, that climate change is not perceived to be particularly threatening by the people of Fuvahmulah. The findings are in accordance with a study by *Arnall and Kothari (2015)* that showed that climate change risks are not of high urgency for Maldivians but contradict the findings of *Stojanov et al. (2016)*. A reason for the discrepancies in the findings can be traced back to where the fieldwork of the studies was conducted. While the latter research conducted a survey in Male' and adjacent islands, the former included fieldwork on peripheral islands, which is similar to this research. This indicates a difference in perceptions in the capital and on peripheral islands. For Fuvahmulah, it can be assumed that the low risk perception of climate change reduces the likeliness of people committing themselves to the cause, which in turn reduces the adaptive capacity (*Wolf and Moser 2011*). Due to a general lack of awareness and knowledge regarding climate change, community members are likely not aware of coastal issues anticipated to affect Fuvahmulah's coast in the context of future climate change impacts. This hampers the likeliness of long-term adaptive action. It has been shown that agency is influenced by people's conviction if they are able to act on risks that affect them or not (*Cinner et al. 2018*).

In more general terms, the investigation revealed that the current situation of addressing coastal issues was characterized by a mismatch between the government's approach and the demands and expectations of the community that presume the local level to be vested with decision-making power as a result of political developments and discourses. The mismatch can be traced back to the shifts of government in 2008 and 2013 that entailed fundamentally different approaches to governing due to ideological differences regarding values and principles by the PPM and MDP parties. As a result, lacking clarity in the policy direction regarding numerous aspects relevant to the study's interest, including the importance of environmental protection and climate change adaptation, decentralization reforms, the importance of community involvement in activities, as well as about beliefs and cognitive frames were found to have led to confusion among survey participants. Especially the back and forth regarding the policies has increased mistrust of the community in the responsible authorities, which constitutes a significant barrier to local adaptive capacity.

Similarly, a second important insight of the research was identifying the effects of the increasing polarization caused by the divisiveness of the courses of actions by the two main political parties regarding the capacity to adapt. In more detail, it was disclosed that the divisiveness influenced the community members' willingness to get involved in planning and implementa-

tion activities due to decreased trust in the government and their inclination to cooperate. Regarding the former, the low degree of trust in the government shown in the survey led to a low likelihood of community members wanting to get involved in activities organized by government actors. Even more, the divisiveness has resulted in a lack of compliance with environmental legislation and regulations by supporters of the opposition party, according to statements of Fuvahmulah inhabitants.

With regard to the community relationships, the data revealed the negative effects of the rivalry between the country's main political parties. It was prominently highlighted how social relationships on the local level were impaired. Inhabitants of Fuvahmulah argued that the partisanship of the politics had degraded the formerly close ties on the islands, resulting in mistrust among community members and unwillingness to work together. People stated that there is widespread concern that not all people are willing to participate in activities organized by community members they believe to be supporters of the opposite political party. Subsequently, these factors hinder the *emergence of community action* and are thereby a highly limiting factor regarding local adaptive capacity (cf. *Paveglio et al. 2009*). In a nutshell, it was shown that cooperation and involvement in activities on the local level had become an issue of partisanship. The above-described lacking social cohesion is a constraint for adaptive capacity: other studies have shown that social cohesion influences if people are willing to organize and coordinate with one another when faced with climate-related risks (*Barnes et al. 2017*). Put differently, a lack of cohesion makes it less likely that the community members work together as a group in discussing which adaptation pathway is the best for their community, which has been argued to be important for decisions made on the local level (*Dodman et al. 2010*). Unlike in the study by *Karlsson and Hovelsrud (2015)*, in which the community bonded more strongly due to the threat of coastal erosion being perceived as very high, the people on Fuvahmulah have not shown signs of bonding due to the threat. It is highly likely that the social and political context has led to such a strong decrease of cohesion that the community members are unable to bond even though a majority assesses the erosion issue as an immense threat for their future on the island. In terms of consequences, lacking social cohesion causes information and skills not to be transferred and context-specific norms to not be formed among the group (*Prior and Eriksen 2013*).

Notably, the politicization of environmental activities has also manifested itself in the trust that is given towards non-governmental actors, such as environmental NGOs. This was the case for the NGO SaveFuvahmulah, which was seen to have strong political affiliations. Island inhabit-

ants thus were dissuaded from participating in NGO-related activities as they were not interested in being instrumentalized for political purposes. With respect to NGOs, it needs to be noted that the shifting political paradigms also brought uncertainty to the relationship between the government and NGOs. As illustrated in the case study, the Yameen administration acted against various NGOs, which led to fewer NGO activities in the country and thereby had a negative impact on the adaptive capacity.

On another note, the capacity to adapt on the local level is also dependent on the knowledge and the capability of developing and knowing about alternative and/or innovative adaptation approaches that are implementable on the local level. The investigation demonstrated that insufficient collaboration on and between the levels reduces the likeliness of the implementation of alternative approaches. In the case study, for example, highly limited collaboration and coordination between government authorities on the national level were identified. More specifically, unclarity regarding the allocation of responsibilities and mistrust among the authorities led to the inability of looking into or adopting innovative approaches regarding policies and system configurations by the few government organizations on the national level that currently possess political authority when dealing with coastal problems in the Maldives. Due to the inefficient structures and mechanisms, the responsible authorities hold on to their top-down approach with respect to addressing coastal issues, which generally disregards the local-level actors and the community and is not open towards alternative institutional arrangements or the implementation of alternative measures. One particular manifestation of this is the focus and propagation of hard coastal protection measures by the responsible authorities, which has led to a *lock-in effect*: the belief that these national government-proclaimed measures are the only solution to the issue of coastal erosion has contributed to the lack of integrating new ideas.

Another factor was found to lead to the rigid approach when addressing coastal problems in the Maldives, namely the lack of expertise regarding different approaches to protecting the coastal zone and climate change adaptation in the Maldives – on the national level and on the local level. As a consequence of a shortage of experts in the Maldives, interviewees on the national level have made it clear that addressing coastal problems in the Maldives is highly dependent on foreign aid and expertise. Studies have highlighted that international donors favor conventional engineered hard coastal protection measures, leading to a disregard for locally implementable alternatives (cf. *Kench* 2012).

Fig. 45 summarizes the key enablers and barriers to local adaptive capacity.

## Understanding the Influences on Local Adaptive Capacity

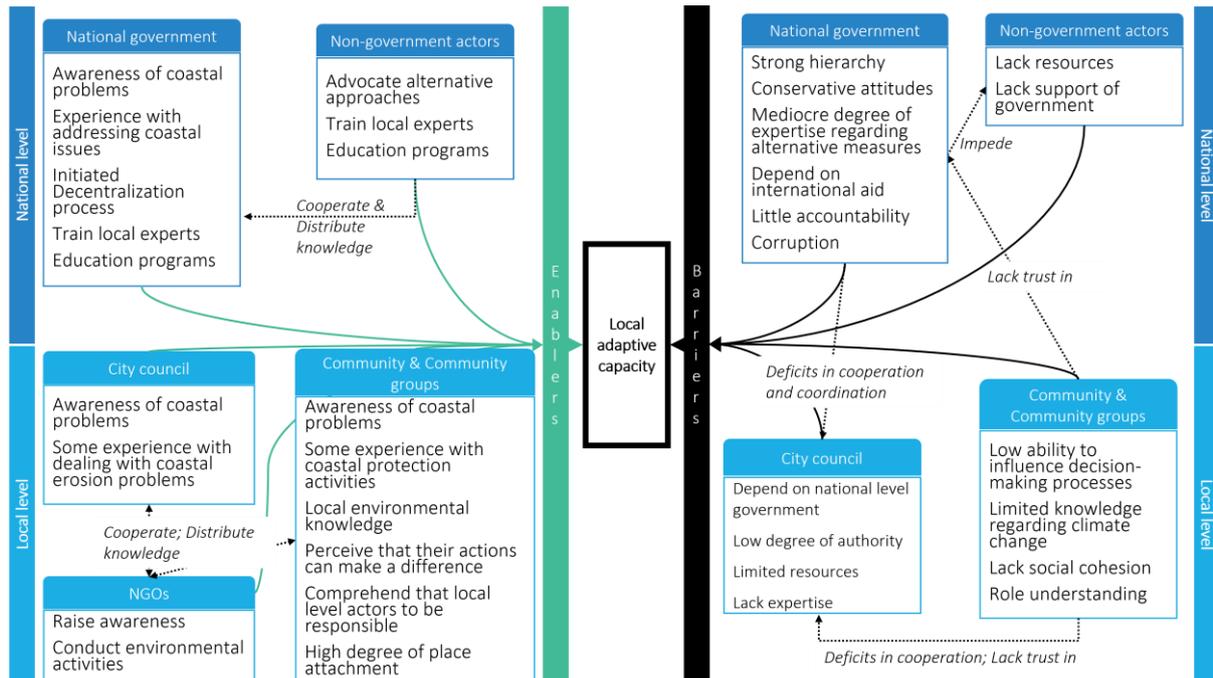


Fig. 45: Key enablers and barriers to local adaptive capacity (own illustration)

### 6.3 Summary: Potential for Change? Overcoming the Barriers through Context-specific Governance

SIDS worldwide need to find adequate responses to the environmental challenges they are already facing today and are bound to increase over the next decades as a result of climate change effects. National governments are often overtaxed by the challenges and are incapable of adequately addressing the issues. Therefore, the role and responsibilities of the local level will have to be strengthened. To achieve this, the need to understand the multi-faceted factors that enable and hinder the local level groups to address these issues is of increasing importance.

In the case of Fuvahmulah, the analysis has shown that the local adaptive capacity was low. Especially the current approach to addressing coastal issues has been revealed to have had negative effects on the capacity to adapt on Fuvahmulah. This was shown by the concentration of power at the national level, as well as the lack of collaboration between and trust among the different actors and groups on the two investigated levels. What has furthermore been shown in detail is that the messy political situation in the Maldives has negatively influenced the resilience of Fuvahmulah's inhabitants by restricting the role of the local level actors as well as the affected community to supplicants of the national level government. It was demonstrated how the sociopolitical context shaped the ways community members act in adaptive ways. In the case of the Maldives, it functioned as a barrier to a more suitable approach to dealing with coastal problems. Furthermore, low levels of expertise and knowledge on how to address coastal issues, especially on alternatives to the conventional approach, were detected. It is,

therefore, emblematic of the current situation that the erosion issues on Fuvahmulah are planned to be addressed by a large-scale revetment implemented by the national government in cooperation with a foreign construction company. Nevertheless, the research has shown that the current approach will fall short of the requirements.

It is noteworthy that the research has shown that in the long-term, a more local-based approach to addressing coastal problems is possible that would be able to complement the activities of the national-level actors. It was demonstrated that a more active role of the community could be enabled in case of a more facilitating environment. On the basis of these conclusions, it is necessary to discuss what changes in the governance approach can lead to improved results and more sustainable developments on small islands in the face of increasing coastal hazards and other risks imposed by climate change for SIDS. All things considered, a reconfiguration of the governance system is necessary to allow more successful adaptation to coastal issues. The research especially highlighted the necessity to understand and scrutinize the diverse roles, expectations, interests, as well as political influences of the involved actors and the community. On a similar note, *Agyare et al. (2015)* have argued that a pluralistic approach to governance is necessary to consider the customs, norms, and the local culture. When applying these considerations to Fuvahmulah, some community members, for example, discussed the coast as a highly cultural place. In contrast, others propagated more strongly on the functional sense of the coast. Another example is that the introduction of democracy did not fully convince some respondents of democratic principles and that the majority rule is a positive development for their island. They believe that the historical decision-making structure was more appropriate. While this specific notion was not widely held and needs to be critically reflected upon, it exemplifies the need for open discussions among all actors and the affected community. The local framework of what is desired and undesired needs to be acknowledged. Important factors include the willingness of the people to get involved in addressing environmental issues, which could limit the dependency on national government authorities and allow for a better adaptation through local action in the future. This furthermore includes the insight of the study that community members have shown interest in alternative coastal protection measures and are knowledgeable about the natural coastal protection services the elements of the coastal ecosystems of coral islands provide. Thereby, this research has provided evidence that the status quo needs to be questioned and that the affected communities need to be better involved in questions regarding adaptation. In this context, there is also the specific need to consider peripherality in the context of adaptation planning and implementation in the Maldives due to the large differences concerning exposure to hazards, availability of funds, and disparities in vulnerability

(McNamara et al. 2019). For instance, while the fortification of the capital's coast is almost complete, community members on Fuvahmulah stressed that this is not the approach wanted for Fuvahmulah.

### **Recommendations for Action**

Interestingly, the case study of Fuvahmulah has also shown one would set one's sight far too low when solely focusing on new paths as it can be fruitful to look at successful approaches from the past as well. It was revealed that knowledge – partially stemming from past experiences – is widely available on Fuvahmulah that redesigned coastal governance approaches could build on. Studies have highlighted the need to improve the integration of knowledge across scales by involving the people on the local level more comprehensively (Fazey et al. 2010). Coastal governance could therefore be improved by integrating information that is attained at the intersection of scientific knowledge and traditional ecological knowledge (Berkes 2017). Furthermore, it is widely acknowledged that it is important to take different forms of knowledge into consideration which is co-produced and transmitted by various actors to deal with issues of complexity such as coastal adaptation. Bettini et al. (2015) have highlighted the necessity to discuss new knowledge among the various actor groups and discuss in how far it can be translated into shared action plans and objectives.

As a consequence, the necessity to improve information, knowledge, and exchange of opinions in forums that allow innovative and effective solutions is stressed by the results. Aldrich and Meyer (2015) have shown that establishing interaction arenas where the different actor groups are able to develop trust, shared goals, and social cohesion, in general, is a good step to take in this regard. There is a clear requirement to collaboratively discuss the objectives and the approach with respect to coastal challenges to allow shared visions and approaches to reach these objectives. The results have revealed that visions and consistency regarding development approaches and goals are important for cultivating adaptive capacity. Continuity in policies and party-overreaching cooperation is needed in times of profound environmental change. It was shown that the short-sightedness of the political actors that primarily aimed at reaching their supporters does not live up to the requirements for long-term planning in environmental protection and climate change and leads to negative developments. However, as one of the interviewees responded with respect to the Maldives having just recently turned democratic, which is why “we [the Maldives] need time” (NN05, 81) for the development of a suitable decision-making structure and the founding of processes.

Responsible organizations, either government or civil society organizations, could attempt to create opportunities for long-term interaction among the involved groups through an increased number of community or recreational activities (*Mathbor 2007*). For the Maldives, it would be important to organize these events across political camps and make them apolitical. Improved communication and interaction linkages between the national and local levels allow a stronger integration of opinions and knowledge of the lower levels into the planning of adaptation measures that currently take place at the national level (*Barnes et al. 2017*).

### **6.4 Reflection on the Approach**

The case study of Fuvahmulah, an island located on the periphery of an archipelago far removed from the capital of the country, was the setting of this study and was utilized as the basis for the employment of the conceptual considerations based on empirical fieldwork. Nevertheless, as a case study research, there were epistemological as well as theoretical limitations, which will be looked into in the following.

#### **6.4.1 Conceptual Limitations**

Firstly, the assessment of adaptive capacity is based on a specific selection of governance variables that were assumed to be relevant for this study. Even though the variables were carefully selected on the basis of previous research, little related research has been done with regard to assessing adaptive capacity with a specific focus on the conditions in the coastal zone and the political influence on small islands in this cultural setting. Therefore, some degree of uncertainty regarding the accuracy and suitability of the variables remains. For example, other variables, such as a stronger focus on resource availability and allocation, can be considered to be of importance in understanding the effects of governance on adaptive capacity, and the present research can only be understood as one step forward among many others in order to reach a better and clearer understanding of adaptive capacity. Consequently, a monitoring and subsequent assessment of the variables would be beneficial to further validate their suitability.

Secondly, the study had a strong focus on the community. By focusing on the interlinkages and the relationships of the governance system and the focus on the community, some shortcomings had to be accepted with respect to the analysis of some of the other actors on the other levels, e.g., the motivations and interests of the national and the local government.

Thirdly, due to time and resource constraints, this research's focus was limited to one of the five dimensions of adaptive capacity, social organization, that *Cinner et al. (2018)* established and could only touch on the other domains of adaptive capacity. For a more comprehensive

understanding and to improve assessments, the other four dimensions, assets, flexibility, learning, and agency, need to be considered more strongly in an analysis. Especially, a focus on the interlinkages and feedbacks between the domains would be highly gainful to understand trade-offs when building the capacity to adapt (cf. *Cinner et al. 2018*).

### **6.4.2 Reflection of Methods**

A number of qualitative and quantitative research methods were combined with the aim of providing an in-depth analysis of the various factors influencing local adaptive capacity in the context of addressing coastal problems and climate change adaptation on a peripheral island of the Maldives. Yet, not all methods were employed without issues, and some brought some unexpected insights. With the aim of making the research process transparent, these aspects are discussed in the following. In particular, the focus is on the peculiarities encountered in working together with a local research assistant for the population surveys.

An important aspect is that the research only provides an understanding of a short specific time frame. The research stressed how fast institutional arrangements can change and how rapidly the political elite is able to influence the understandings and preferences of islanders. Political actors on the national as well as on the local level are likely to change their opinions and priorities, which in turn affects the opinions, interests, and perceptions of other actors. Furthermore, actors and organizations that were shown to be of importance at the specific moment in time might become inactive again soon when circumstances change. The dynamic situation was furthermore demonstrated by the effect it had on this research. While the political quarrels of the country were a specific focus of this thesis, political developments, i.e., the declaration of the State of Emergency by President Yameen in February 2018, led to the postponement of the second field trip for a number of months. This State of Emergency, which was more of a political maneuver of President Yameen attempting to prevent being removed from office than an actual emergency situation, convinced the author that it might be useful to look into the effects of these political quarrels during the second field trip.

When conducting research in social science, there is a need to keep in mind that the research is coined by the researcher's own interpretations. The researcher's educational and cultural background as well his experiences shape all steps in the research process. While it is impossible to fully eliminate this bias, it is important to acknowledge the fact in order to minimize the effects on research. The role as an external observer can be seen as something beneficial for this study. Observations as an outsider allowed a perspective on community life and relationships on the island that local people are less likely to possess. Furthermore, there are only a few people on

Fuvahmulah that have not lived there for multiple years and can give an outsider's perspective on the situation and relationships, which makes this research more fruitful.

Another facet to consider, when looking at the situation with the eyes of an outsider, was the strong focus on political factors of the second field trip's survey. Even though numerous Maldivians stated that politics is a widely discussed topic in everyday life, it was unclear if interview partners would be open to discussing the issue with a foreigner. Due to this, before specifying the concrete research aim for the second field trip, advice from a number of Maldivian contact persons was sought if it would be appropriate to pose political questions. All contact persons were supportive of the idea and did not see a problem of discussing politically-oriented questions with locals, as politics in the Maldives is seen as something omnipresent, and it is widely discussed in society. Nevertheless, it was advised not to ask for political or party affiliation to not evoke distrust. In consequence, party affiliations of the interview partners cannot be directly derived from the research data. For the analysis, the research had to resort to approximations.

In combination with the survey and the interviews, the observations of everyday life and the consideration of historical sources and media allowed a better understanding of everyday life on Fuvahmulah and the Maldives. The observations allowed to include further information that was gathered in the two fieldwork stays on Fuvahmulah, especially by understanding the people's relationship with the coast and how they felt threatened by progressing erosion effects. Furthermore, the observations allowed a better understanding of the relationships within the community and the opinion of community members on politics. In general, the people of Fuvahmulah have shown rather high interest towards this research. Many community members exhibited a positive attitude towards this work as they thought it to be helpful that someone from outside showed interest in the coastal issues they were facing. They also appreciated that the research done was not on behalf of a political party in the country, as people have grown skeptical towards politicians trying to make the community believe that they were truly interested in the coastal issues of the island.

### **Working with a Research Assistant**

One particular challenge of conducting research in the Maldives was working with a local research assistant. The research assistant was necessary for two reasons: Firstly, a local person joining the survey was instrumental in introducing the research at the doorstep, as foreigners on the island were still seen as somewhat alien. Working from door to door was seen as necessary as the highest success rate of reaching people was by knocking on the doors because people

were much less likely to be accessible during the few public activities on the island. And secondly, the research assistant was necessary for translation purposes during the survey. Due to the explorative character of the study, both questionnaires comprised mostly open-ended questions in order to garner as much qualitative information as possible during the interviews. A questionnaire with more closed questions would not have been suitable to elicit as many different opinions and ideas to the same extent. Thus, the survey with a research assistant seemed to be most appropriate and provided more positive than negative effects. However, a number of aspects need to be critically noted regarding the work with the research assistant. It has to be acknowledged that the research assistant was an inhabitant of Fuvahmulah, which likely affected the answers of the interviewees. Nevertheless, it was believed by all Maldivian advisers that the interviewees' answers would not be falsified as long as the research assistant is not known to have political affiliations, which was ensured through a careful selection process.

Another serious challenge was the translation of the interviews. While the fluency of younger Maldivians in English is quite high, especially the elderly do not have a good command of the English language. While the research assistant was fluent in English as well as in Dhivehi, he was not a professional interpreter. In consequence, it is likely that some details in the interviews might have been misinterpreted in the process. Nevertheless, since the research focused on ideas and perceptions and did attempt to produce a literal account of the interviewees' responses, this issue was seen as manageable. Nevertheless, after each interview, ambiguities that had come up during the interview were discussed between the surveyors. This additional step helped to mitigate such language problems.

The language barrier made the research more difficult in other ways as well, which has likely affected the quality of the research. Firstly, the access to various types of sources was limited: Many laws, regulations, policy briefs, as well as speeches on the national level or newspapers are only available in Dhivehi, and translations were not readily available. Secondly, informal talks on Fuvahmulah were limited to English-speaking islanders. With Dhivehi skills, better access to spontaneous speech intentions by the local population would have been possible.

## 7 Conclusion

This thesis set out to better understand how to assess to what extent local actors on small islands possess the capacity to adapt to coastal stressors and how this is influenced by the governance system and the sociopolitical context the system is embedded in. These questions are of particular urgency in the light of worsening coastal situations in small island countries and increasing pressures through climate change impacts as well as local human interferences. Based on these considerations, the main research question was:

**How is local adaptive capacity enabled or hindered by influences from multi-level governance and the local context within a broader political context?**

This closing chapter begins with an overview of the outcomes before examining the conceptual implications for adaptive capacity this thesis has contributed. The paper concludes with the social relevance of this study.

### 7.1 Key Findings

Based on the findings of two population surveys, semi-structured interviews, a literature, document, and media analysis, as well as observations, the results have underlined that local adaptive capacity cannot be assessed by only understanding the factors on one level of the governance system and by neglecting the contextual factors. This would provide an incomplete assessment without depth and understanding of the causes. The findings have highlighted the significant effects of the interlinkages between the multiple levels of the governance system and particularly the influence of higher-level actors on the adaptive capacity of the lower level in a direct and indirect manner.

As regards barriers to local adaptive capacity, a significant finding of this thesis was to empirically highlight how the national level has undermined local adaptive capacity in the context of coastal governance. It was demonstrated how the adaptive capacity on Fuvahmulah was constrained due to the strict hierarchy and large power differences between the levels. Powerful national actors, first and foremost the MEE, have a history of making decisions without consideration of information and knowledge from the local level. There was only low accountability of the national government towards the lower levels. Those in power demonstrated a predisposition to act conservatively, which resulted in innovative approaches to coastal adaptation being stymied. Furthermore, informal institutions, such as corruption and nepotism, were identified to act as barriers against establishing better cross-level interactions and against the inclusion of lower-level actors and the community. As illustrated, these factors led to a distrust of

## Conclusion

the community members in the actors with power. Moreover, a disconnect between the national level authorities and the affected local level was found, and that coordination across the levels has been insufficient. Consequently, the local government and the community were shown to be highly constrained in their options to act in adaptive activities, as shown in the following. The local government's capability to act was restricted by lacking financial and technical resources to react to stressors. Even more, the city council did not demonstrate the willingness to be less dependent on the national government. Furthermore, there was only limited knowledge and information on coastal issues and adaptation options available on the local level, which was mainly attributed to the missing top-down transfer of knowledge by the relevant government entities. Concerning Fuvahmulah's community, it was shown that there is little integration of their local knowledge, opinions, and interests into the planning of development projects. Furthermore, people showed limited knowledge of and interest in partaking in activities that were open to their participation. The recent experiences of how development projects have been dealt with have led to the perception in their eyes that dealing with coastal problems is an issue of the national and local government rather than their own.

Nevertheless, some aspects have been identified as enabling factors for local adaptive capacity. For the community, an important factor that motivates people to become more involved is the place attachment of the people and their deeply felt desire to preserve *their island* against future threats. It was shown that for the local population, past experiences with respect to managing their own affairs in this area remained relevant and that a part of the community still sees themselves as active participants in development projects. It was also shown that policy reforms in the form of the *Decentralization Act* have shifted the community's understanding of the distribution of roles and allocation of responsibilities. It was shown that some community members had perceived a shift of the responsibility for development projects from the national level towards the lower level. A number of linkages between actors on the different levels were important in enabling local adaptive capacity. Mostly, the sharing of information and knowledge between actors on the national, mostly non-governmental organizations, and on the local level were shown to enable a learning process, which has led to the consideration of alternative approaches to coastal issues. Horizontal links were shown to have increased the organizational capacity on the local level by linking actors and thereby allowed the integration of the community in decision-making processes. Furthermore, on the national and local levels, leaders have been shown to inspire community members to become active in mitigation and adaptation activities by placing environmental and coastal issues at the center of their political agendas.

## Conclusion

Another important finding was to demonstrate how the political shifts of the past decades impacted the local adaptive capacity in the Maldives. It was shown that coastal adaptation and the participation of community members had been politicized. Climate change adaptation and coastal issues have been shaped by discourses employed by the country's political elites, which has created a strong bias towards technical solutions to coastal issues. It was shown that the people's willingness to get involved in adaptation efforts depended on how the problem was framed by the political party they supported. Furthermore, the quarrels between the political parties and the resulting partisanship have decreased societal cohesion and, thereby, lessened the likeliness of people cooperating on the local level.

All in all, the findings underline the need for understanding the broader governance structure as well as the contextual settings when it comes to assessing the capacity to adapt at the local level. The findings strengthen the notion that the local level needs to be involved and can implement adaptation efforts from the national government but give a clear guideline that the heterogeneity of the local level needs to be taken into account as well as the accompanying factors. The next part focuses on how the assessment of adaptive capacity needs to focus stronger on the multiple levels of the governance system as well as the sociopolitical context.

### **7.2 Conceptual Implications**

As discussed in the second chapter, it has been established that adaptive capacity on the local level is growing in importance. The capacity to adapt is a solely positive characteristic of which a system cannot have enough of. However, it can be hindered and enabled by social as well as political influences. In this regard, it has been demonstrated by academic studies that adaptive capacity is context-, place- and culture-specific (*Stott and Huq 2014, Ayers and Forsyth 2009, Smit and Wandel 2006*). However, studies on how local-level adaptive capacity is shaped by political and social processes and factors on the various levels have remained sparse. This research provided further insights into how to achieve a deeper assessment of adaptive capacity by focusing on multi-level governance and community-specific features that focus on these political and social dynamics. The research contrasted the local level's role with factors applicable to higher levels, particularly the linkages and feedback between the levels that enable or hinder adaptive capacity on the local level. These considerations made it possible to give directions on approaches to developing management and governance institutions that better adapt to future changes. In the following, based on the conceptual considerations developed in chapter 2 in connection with the case study's findings, it is argued for the necessity of including the two

guiding aspects of this thesis in future assessments of adaptive capacity: multi-level governance and the sociopolitical context.

### **7.2.1 Influences of the Multi-level Governance Structure**

Coastal governance is shaped by various factors, from a multitude of involved actors on various levels, the formal and informal arrangements, to structures and processes (*Glaser et al. 2018, Ojwang et al. 2017*). This research was able to further insights into how a multi-level governance perspective allows for a better assessment of adaptive capacity in a coastal context. In detail, this investigation of the multi-level governance system of the Maldives has demonstrated on the basis of empirical evidence how linkages and feedbacks on and between the actors on the various levels have enabling and constraining effects on the adaptive capacity at the local level. A contribution of the research toward existing research in the context of assessing adaptive capacity was to highlight the interactions and cross-level linkages within the coastal governance system by analyzing the national and the local level at the same time. This allowed uncovering patterns in practice that limit the capacity to act of the local level.

For instance, insights of the study highlighted the necessity to investigate the self-perception and outside perception of the role of all actors within the governance system when assessing adaptive capacity. This was particularly shown by the perceptions of the role of the community in coastal adaptation projects. On the one hand, the community has perceived that the actors and the community on the local level have been empowered to be more strongly involved in and responsible for projects in the context of protecting the coast. A surprising finding was the revelation that the implementation of the *Decentralization Act* changed the perceptions of the community members as to the allocation of responsibilities even though the devolution was never fully implemented by the actors in power. Community members demonstrated interest in being more involved in activities dealing with coastal problems, from participating in activities to stronger involvement in decision-making. On the other hand, the national government has maintained its conservative top-down approach. The national government actors perceive that the national government entities have the sole mandate to decide how to approach the problems and act accordingly, despite the national level stressing the stronger involvement of the involved groups on the local level in formal institutions. These disparate understandings of appointed roles and the negative experiences of being neglected in decision-making processes have led to disappointment in the community, which likely has a negative consequence for stronger involvement of the community due to the islanders' distrust in the national level actors.

## Conclusion

Next to this, the investigation of the formal and informal institutions has disclosed the hierarchy and the resulting power asymmetry within the coastal governance system. The historically grown strong power gradient between the national government and local level actors has shown to cause a perceived dependency of the local level government on the national level. Local-level political actors have a self-perception to be unable to deal with the coastal issues as they assess technological approaches that are implemented through the national government to be the sole approach to handling the problems.

### **7.2.2 Influences of the Sociopolitical Context**

A central addition of this work to existing research was to demonstrate the necessity of considering the sociopolitical context when assessing adaptive capacity.

The findings of this research highlighted how the unequal representation of actors in the coastal governance system led to the inability of local-level actors and the affected community to influence the approach of addressing coastal issues. It was demonstrated that the local level's interests are overshadowed by the interests of the national elites that dominate how adaptation is approached on all levels. While this is not a particularly new insight, it does, however, provide important conclusions for assessing local adaptive capacity. For instance, due to the inequality in representation, non-adjusted coastal protection measures are implemented on the affected islands that stand in contrast to the islanders' preferences and do not consider local environmental knowledge. By understanding the relationships between the involved groups, which was traced back to historical developments of the Maldivian political system as well as contemporary political tensions, it was possible to understand the reasons for lacking cooperation and involvement of groups on the local level.

Also, the importance of including a critical position in the analysis was demonstrated prominently by highlighting the effects of the continuing political instability in the country. On the one hand, starkly contrasting policies of recent administrations at the national level have caused distrust in the national government. The back and forth of the decentralization process and the missing implementation of the devolution of power by political actors on the national level has therefore resulted in the disinterest of community members wanting to be involved in decision-making processes. On the other hand, the large degree of polarization has decreased the willingness of community members to collaborate and coordinate with political actors on the local as well as on the national level. And furthermore, the political divisiveness identified on all levels was shown to decrease the likeliness of community members to cooperate due to distrust. All in all, these aspects explained missing links between actors on and across levels, which are

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crucial to negotiating between parties and thereby developing shared aims on approaching coastal challenges and committing to these collaboratively shaped objectives.

Lastly, the starkly shifting discourses in relation to climate change and environmental governance of important political actors on the national level have shaped the opinions of community members on how coastal issues should be addressed. While Nasheed's administration propagated the responsibility of individuals in climate change mitigation and adaptation, which was shown to have motivated numerous individuals to become active in environmental activities, Yameen focused on top-down approaches and large-scale infrastructure development and investments. These differing approaches by the administrations have led to disparate understandings regarding the understanding of the most suitable approach to addressing environmental issues in general and adaptation in particular between supporters of the two political parties. In consequence, shared visions and solutions were absent on the local level. Consequently, by revealing the discourses and their intended effects, there is potential to counteract their influences and possibly allow leeway for designing alternative approaches to address coastal issues with the broader support of the affected community.

In conclusion, the investigation highlighted that it is at least as important to understand the sociopolitical context as much as it is to understand if the institutions that shape the governance structure are successful or not (*Nightingale 2017*). As *Nagoda and Nightingale (2017)* have shown for participatory approaches in climate change adaptation in Nepal, there are complex socio-political dimensions that need to be taken into consideration. They caution that adaptive learning and co-management concepts fall short when designing future climate change adaptation approaches. Derived from the findings of this work, adaptation needs to be understood as a societal endeavor that is highly influenced by politics and power relations and not as a solely technological issue (*Ratter et al. 2016*). *Nightingale (2017, 12)* has poignantly stated that: "power is constitutive of adaptation rather than an externality that requires post-implementation management."

### **7.3 Social Relevance of the Research**

This thesis undertook to better assess adaptive capacity on the local level. By improving the understanding of the capacity, ways on how to build adaptive capacity can be better identified. A stronger local approach can be seen as potentially beneficial due to the shortcomings of prevalent top-down approaches in coastal adaptation and can complement the national government's efforts. This work highlighted the need to understand adaptation as a complex process and how it is shaped by a wide range of enabling and hindering factors. It highlights the necessity to

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consider the embeddedness of assessing the adaptive capacity in a multi-level governance structure that is influenced by specific sociopolitical factors. The findings of the assessment of adaptive capacity have demonstrated the importance of considering these social and political factors to fully understand the capacity to adapt. Thus, the framework utilized in the study provides an approach for policymakers, researchers, and community leaders to better understand which factors based in the governance system and the wider context have influenced their capacity to act. Strong influences on the population's commitment to engage themselves in the political process and on the perception of environmental issues have been demonstrated, just to name a few. Additionally, the acknowledgment of the community's heterogeneity in the study allowed a more in-depth analysis of the situation. All in all, these aspects can guide the assessment and support identifying factors to adjust and to remove barriers against the building of adaptive capacity.

The findings are relevant in highlighting the need to rethink adaptation approaches and to take alternative approaches into stronger consideration in the light of increasing pressures on small islands. Particularly, the results of this thesis demonstrated that the local community is potentially willing to become stronger involved in activities addressing coastal problems and is welcoming towards alternative coastal protection measures, which was surprising to those involved in the analyzed governance system. In general, coastal communities are often presented as being vulnerable and having little leverage to be able to achieve positive effects (*Armitage et al. 2017, Lazrus 2012*). The importance of considering the coastal peoples' interests, perceptions, norms, and values when looking for effective and sustainable coastal adaptation is illustrated. This thesis highlighted the possibilities for and the willingness by groups on the local level to effect positive change and be less dependent on actors on other levels, even if these dependencies have been ingrained in the governance system. It was shown that there is a strong urgency to rethink coastal adaptation by politicians as well as local people. This research highlights pathways on how the local level can be empowered by presenting options that can be performed by organizations and people on the level that is affected by coastal problems. This can be particularly helpful in the face of overtaxed and inactive actors in power. Thereby, the situation of the local actors could be transformed from being recipients of coastal governance towards more active participation in coastal governance, providing them a voice in the decision-making process (cf. *Lazrus 2012*). This would help ensure that their rights and interests are more fully respected and represented. With this objective in mind, the research was shared with actors on Fuvahmulah, Male' and other islands of the Maldives to present ideas and approaches on how

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the local level could be more strongly involved in addressing coastal issues. Implementation, however, depends on future developments at the political and social levels.

## 8 References

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**9 Annex**

**Annex I: List of interview partners**

Inter- view ID	Date	Organization/ Posi- tion	Location	No. of in- terviewees	No. of inter- viewers
<b>2017</b>					
<b>NG01</b>	03/09/2017	Ministry of Environ- ment and Energy	Male'	5	3
<b>NN01</b>	03/09/2017	Intergovernmental or- ganization	Male'	2	2
<b>NN02</b>	03/11/2017	Non-governmental or- ganization	Male'	1	2
<b>NG02</b>	03/11/2017	Environmental Protec- tion Agency	Male'	1	2
<b>NN03</b>	03/12/2017	Researcher	Male'	2	2
<b>NG03</b>	03/12/2017	Ministry of Environ- ment and Energy	Male'	1	2
<b>NG04</b>	03/12/2017	Ministry of Environ- ment and Energy	Male'	1	1
<b>LG01</b>	03/14/2017	City Council	Fuvahmulah	3	3
<b>NG05</b>	03/14/2017	Ministry of Environ- ment and Energy	Fuvahmulah	1	2
<b>LC01</b>	03/15/2017	Teacher	Fuvahmulah	1	1
<b>LN01</b>	03/16/2017	Non-governmental or- ganization	Fuvahmulah	1	3
<b>NG06</b>	03/25/2017	Ministry of Environ- ment and Energy	Fuvahmulah	1	1
<b>LN02</b>	03/26/2017	Non-governmental or- ganization	Fuvahmulah	1	1
<b>LC02</b>	04/03/2017	Teacher	Fuvahmulah	1	1
<b>LG02</b>	04/03/2017	Former atoll council member	Fuvahmulah	1	1
<b>LG03</b>	04/08/2017	Former atoll council member	Fuvahmulah	1	1
<b>LG04</b>	04/08/2017	Former atoll council member	Fuvahmulah	1	1
<b>LG05</b>	04/09/2017	Ministry of Environ- ment and Energy	Fuvahmulah	2	1
<b>NN04</b>	04/13/2017	Researcher	Male'	1	1

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<b>NN05</b>	04/14/2017	Intergovernmental organization	Non-government	3	1
<b>2019</b>					
<b>NN06</b>	01/17/2019	Researcher	Male'	1	2
<b>LN03</b>	02/03/2019	Non-governmental organization	Fuvahmulah	1	1
<b>LN04</b>	02/11/2019	Non-governmental organization	Fuvahmulah	1	1
<b>LG06</b>	02/14/2019	Former atoll council member	Fuvahmulah	1	1 (+translator)
<b>LG07</b>	02/14/2019	City council	Fuvahmulah	1	1
<b>LG08</b>	02/15/2019	Former atoll council member	Fuvahmulah	1	1 (+translator)
<b>NN07</b>	02/16/2019	Non-governmental organization	Male'	3	1
<b>NN08</b>	02/17/2019	Researcher	Male'	1	1
<b>NG07</b>	02/20/2019	Ministry of Environment	Male'	1	1
<b>NG08</b>	02/21/2019	Intergovernmental organization	Male'	3	1
<b>LG09</b>	02/24/2019	Ward council member	Addu City	2	1
<b>LG10</b>	02/25/2020	City council member	Addu City	1	1
<b>LN05</b>	02/25/2019	Non-governmental organization	Addu City	1	1
<b>NG09</b>	02/26/2020	Ministry of Environment and Energy (former)	Addu City	1	1
<b>LG11</b>	02/27/2019	Ministry of Environment	Addu City	1	1

## **Annex II: Related Publications**

*The following publication emerged in the context of the present work:*

*David, C.G., A. Hennig, B.M.W. Ratter, V. Roeber and T. Schlurmann 2020, in review: Maldevelopment and climate change on small islands due to conflicting attribution of root causes. – Ludwig-Franzius-Institute for Hydraulics, Estuarine and Coastal Engineering. – Leibniz Universität Hannover. (Published in 2021: David, C.G., A. Hennig, B.M.W. Ratter, V. Roeber and T. Schlurmann 2021: Considering socio-political framings when analyzing coastal climate change effects can prevent maldevelopment on small islands. – Nature Communications **12**: 5882 (2021).)*

*Hennig, A. and B.M.W. Ratter 2020: Lokale Herausforderungen auf den Malediven zwischen globaler, regionaler und nationaler Verflechtung. – Geographische Rundschau **4**: 22-27.*

*Ratter, B.M.W., A. Hennig and Zahid 2019: Challenges for shared responsibility. Political and social framing of coastal protection transformation in the Maldives. – DIE ERDE **150** (3): 169-183.*