Ecosystem services and the blue economy:

navigating power and values

Thesis submitted by

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July 2020

for the degree of Doctor of Philosophy in Environmental Science at Lancaster Environment Centre,

Lancaster University, Lancashire, United Kingdom

Acknowledgements

I feel very lucky for having been able to embark on this PhD journey. When I started, I had no clue about what to expect, and I am so grateful to my supervisory panel for welcoming and supporting me. Christina Hicks has been a great source of inspiration, setting an example for how I want to be as an academic, and being so kind and thoughtful at the same time. It has been a joy to exchange ideas and learn from you during our weekly meetings, and I have benefitted greatly from your advice. I am grateful for the many get togethers at your house and the fun we had on conference travels. Thank you, Christina.

Jacob Phelps has always been available for support and feedback throughout my entire time at Lancaster. His enthusiasm kept me going at times when I needed the energy the most. He has also allowed me to be involved in a variety of his projects, inviting me to share my views on them. It is also thanks to Jacob's mentoring that I was able to obtain my teaching certificate, because he allowed me to become closely involved in designing and delivering one of his modules. Thank you, Jacob.

Claire Waterton's guidance has allowed me to explore theories and concepts that I had never heard of before, as she patiently shared her wisdom with me. Even though we did not see each other often, I always came back from her office full of ideas and thankful for the opportunity to share my thoughts with her. Thank you, Claire.

My time at Lancaster was made so much more enjoyable thanks to the great friends and colleagues I was surrounded by. It has been a joy to be a part of the Lancaster Environment Centre, with its wide array of interesting and kind people. Thank you to my teammates at Lancaster Phoenix and the Lancaster Ligers – playing korfball with you has often been key to keeping me sane. Many thanks also to the members of the LEC-REEFS group: we have collaborated on research, travelled to various places for fieldwork and conferences, and even fought rats together. It has always been so much fun to be a part of such a supportive and friendly group. I am proud to have been a member of the OG crew with Jan and Ellie, later joined by Anna. Special thanks to Jeneen who gave me a roof over my head during my final months in Lancaster.

Much of my fieldwork would not have been possible without support from the Blue Economy Department (Government of Seychelles), the Seychelles Fishing Authority, and the University of Seychelles. I am very grateful for the logistical and staff support. Many thanks also to all the fishers, tourism operators, and residents who generously gave their time and insights so that I could write this thesis. My time in Seychelles has been made so much more fun by the friendly people I met along the way, and who were always there for a beer or a chat. Special thanks to Craig Joseph, who not only introduced me to Seychelles' night life, but also welcomed me into his family. During my fieldwork, I have been supported greatly by Clara Belmont, who is now not just a colleague but also a very dear friend. The foundation of our friendship was built driving around Mahé, searching for fishers to interview. Together in the car (with a slight smell of fish), we discussed life, our dreams and our aspirations. I never expected to find this kind of friendship during a fieldwork trip. Thank you, *kwever*.

Finally, I thank my family and friends back home in the Netherlands. Sociëteit de Kameraadschap, dankjewel voor de onvoorwaardelijke vriendschap, de goede gesprekken en de lol die we samen hebben. Papa en mama, zonder jullie was niets van dit alles mogelijk geweest. Dankjewel voor jullie steun en het geloof in mij, dat ik altijd bij jullie terecht kan, en jullie enthousiasme voor mijn altijd weer verrassende plannen. Simon, broertje, jouw relativeringsvermogen en humor helpen mij alles in perspectief te zien. Tenslotte, Ezra, je bent mijn rustpunt en de inspiratie om het beste uit mezelf te halen. Bedankt voor je geduld en de aanmoediging die je me steeds weer geeft.

Declaration of contribution of others

Research funding

Funding for this PhD-project was provided through Christina Hicks' European Research Council funded starting grant, a Lancaster University FST and LEC PhD Studentship, Lancaster University FST travel grants, Lancaster University Graduate College travel grants, and the Friend's programme Research Travel Conference Fund.

Research support

Field support

Clara Belmont, Stephanie Marie, Eugenie Khani, Uvicka Bristol, Rowana Walton, Anna Woodhead

Interview design

Clara Belmont, Stephanie Marie, Eugenie Khani, Prof Christina Hicks, Dr Jacob Phelps, Prof Claire Waterton

Interview translation

Eugenie Khani, Clara Belmont, Noreen Hoareau

Editorial support

Prof Christina Hicks

Dr Jacob Phelps

Prof Claire Waterton

Logistical support

Seychelles Fishing Authority

University of Seychelles

Blue Economy Department, Government of Seychelles

Permits and ethics

A research permit was provided by the Seychelles Bureau of Standards under Permit Number A0157. Ethical approval was obtained from the Faculty of Science & Technology Ethics Committee through submission of application forms. Approval was granted on 6 April 2017 and 17 July 2017 under Approval Numbers FST17096 and FST16180. Changes and/or additions to the project were discussed with the committee. I obtained informed consent verbally prior to all interviews, and digitally prior to the online surveys.

Contributions per chapter

Chapter 2: Speaking across boundaries to explore the potential for interdisciplinarity in ecosystem services knowledge production. Adapted from: Schutter, M.S. and Hicks, C. (in revision at ***Conservation Biology***). Speaking across boundaries to explore the potential for interdisciplinarity in ecosystem services knowledge production. Contributions: I developed the research question for this chapter, collected and analysed the date, and wrote the chapter. CH provided me with advice during the development of the research questions, data collection process and analysis, and assisted with the structuring and editing of the manuscript.

Chapter 3. Disentangling ecosystem service preferences and values. Adapted from: Schutter, M.S., Hicks, C., Phelps, J., Belmont, C. (in review at ***World Development***). Disentangling ecosystem service preferences and values. Contributions: I developed the research question for this chapter. CB and I collected the data for this chapter. I analysed the data and wrote the chapter. CH and JP provided advice on the research question, study design, data collection and analysis, and assisted with structuring and editing the manuscript.

Chapter 4. Perspectives on the blue economy in Seychelles. Adapted from: Schutter, M.S., Hicks, C. 2019. Networking the blue economy in Seychelles: pioneers, resistance, and the power of influence. ***Journal of Political Ecology***, 26(1) pp. 425-447. Contributions: I developed the research question for this chapter. CB and I collected the data for this chapter. I analysed the data and wrote the

chapter. CH and JP provided advice on the research question, study design, data collection and analysis, and assisted with structuring and editing the manuscript.

Chapter 5. Maintaining blue economy hegemony at the global and local scale. Adapted from: Schutter, M.S., Hicks, C., Phelps, J., Waterton, C. (in prep, ***Marine Policy***). Maintaining blue economy hegemony at the global and local scale. Contributions: I developed the research question for this chapter, collected and analysed the date, and wrote the chapter. CH, JP and CW provided me with advice during the development of the research questions, data collection process and analysis, and assisted with the structuring and editing of the manuscript.

Abstract

Reconciling competing interests is a key challenge for environmental governance, especially in marine ecosystems, which are facing a combination of environmental pressures and high levels of human dependence. At the same time, there is increasing interest in oceans as a source of economic growth. Marine ecosystems are often characterised by legal plurality, which adds another challenge for effective governance. Marine ecosystems governance is therefore complex, and it has been proposed that interactive governance that aligns the values and principles of different governance actors is needed to address multiple interlinked, but sometimes also competing, goals and interests. Contemporary governance approaches increasingly emphasise the interlinked interests of humans and nature, as demonstrated the concept of ecosystem services and the recently emerged blue economy. Ecosystem services are defined as "the benefits people obtain from ecosystems" (Millennium Ecosystem Assessment 2005 p. v). The blue economy has various definitions, that commonly emphasise "improvement of human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities" (The Commonwealth 2020 p. 1)

Ecosystem services and the blue economy are thought to together offer potential for the alignment of different interests through their emphasis on multiple and interlinked goals for environmental governance. Whilst the blue economy informs wider policy discourse, ecosystem services can be seen as the materialisation of this discourse through capturing preferences and values on the ground. However, aiming for the simultaneous optimisation of different dimensions does not guarantee alignment of values, worldviews and images within or among elements of governance, and across scale. The question remains whether these increasingly dominant approaches to marine environmental governance succeed in demonstrating the importance of biodiversity whilst integrating diverse social, economic, and environmental interests. The ecosystem services concept tends to be directed at the system to be governed (e.g. ecosystems and resource users), whereas the blue economy concept is directed at the governing system (i.e. national governments and decision makers), and although they are related, it is not clear to what extent they are capable of connecting these different scales.

In this thesis, I set out to develop a better understanding of the extent to which the evolving landscape of marine environmental governance contributes to aligning the values, worldviews and images of the

governing system with those of the system-to-be-governed. To achieve this, I examine the blue economy and ecosystem services using different methods, from different angles, and at different scales. Thus, my aim is to assess the ability of both concepts to engage with a variety of actors in principle (in research and policy discourse), and the shape they take in practice, where they impact resource users. Successes would suggest interaction and negotiation among actors is possible such that the long-term underlying values, which shape governance, can inform and are informed by the short-term preferences, that are time-bound, and shape management on the ground. Specifically, in my thesis I ask whether an ecosystem service approach, which is focused on preferences, adequately captures the full range of peoples' diverse and plural values, and whether the blue economy is reflective of these values on the ground. Therefore, the contribution of this thesis is the exploration of how values, worldviews and images interact to shape governance at local, national, and international scales.

I use bibliometric and network analysis to assess interdisciplinarity in ecosystem services research. My approach focuses on evaluating the extent to which an article's citations draw on knowledge from across disciplinary boundaries. I find that research on ecosystem services continues to grow exponentially, and that there is an increasing number of disciplines involved. This increase is also reflected in the growing number of social science disciplines that publish on ecosystem services. However, the proportion of social science involvement has remained stable over the years, and ecology-based knowledge, and therefore worldviews, remain the most influential in the field. Interestingly, economics, often highlighted as having a disproportionate influence in ecosystem services, appears marginal in the field's development and network. Nevertheless, the growth of social science involvement in ecosystem services research points at potential for the inclusion of heterogeneous knowledge and plural worldviews. This could help the concept to return to its goal of connecting ecological functioning with human well-being, thereby raising support for conservation.

Next, I apply the ecosystem services concept in a resource user-setting, eliciting preferences for specific ecosystem services through a ranking exercise and exploring the link with underlying values. I find that preferences are associated with underlying values that overall are considered unimportant, and that directly asking people to explain their preferences gives better insight into the reasons why they ranked the services the way they do. In addition, the reasons that people give were more aligned with the general values structure

of Seychelles, which prioritises self-transcendence values over self-enhancement. I identify a need for the explicit deliberation of values in environmental governance, in order to align the realities of the system that is being governed with the institutions of the governing system, but also with their underlying values, worldviews, images and principles.

Following this, I apply Q-methodology and interviews with people in roles of formal decision-making in environmental governance to explore images of the blue economy as expressed in perspectives on the concept in Seychelles. I find three perspectives on the blue economy in Seychelles: *supportive* in principle, *critical* in practice; *pragmatic and accepting*; and *idealistic*. These perspectives reflect some of the international critique on the concept, for instance doubts around the reconciliation of environmental and economic interests. However, I find that much of international discourse was not reflected in the perspectives in Seychelles, and very limited attention for the social dimension of the blue economy. Social concerns were only expressed by one of the actors, who was found to be of very low influence in the network of actors involved in the blue economy.

Finally, building on interviews and observations from the wider governance landscape, I consider power relations within Seychelles as a part of the increasingly dominant blue economy narrative internationally. I find that internationally, the blue economy is maintained as influential through persuasion and the creation of a 'common sense', presenting the possibility of triple wins through rational management. On the ground, despite the sense that there are critical voices as Seychelles is shaping the blue economy, outward discussion is stifled by depoliticised decision-making processes, leading to simmering discontent that is only expressed in private. The internationally hegemonic status of the blue economy concept persists locally.

Throughout my thesis, themes of values, power, depoliticization and dissent emerge as critical issues in the alignment of different governance actors. Ecosystem services take place within the system-to-be-governed, whereas the blue economy is a powerful discourse in the governing system. Therefore, both approaches present the possibility of complementing each other to facilitate alignment between the system that is being governed and the governing system and mediate their interactions. However, this alignment is inhibited by a lack of deliberation on values, worldviews and images that underpin governance, and are therefore essential

to discuss. This lack of deliberation is facilitated by power dynamics and depoliticization. Power is mediated by the boundary object status of both ecosystem services and the blue economy, which although versatile, also can stifle discussion about incompatible interpretations of both concepts. Boundary objects can become a source of power by creating a 'common sense' in which conflicting interests are resolved rhetorically, thereby gaining power through persuasion. The boundary object status of the blue economy also contributes to the depoliticization of discussions, prioritising techno-managerial approaches instead.

However, I also found that dissent is emerging both on the ground and in academic critique. This dissent is leading to calls for more deliberative and participatory approaches to the blue economy and ecosystem services, which would allow for exploration of the shared values, worldviews and images that underpin environmental governance. Thereby, pressures on and demands from marine ecosystems could be reconciled through interaction between different elements of society. Comparing people's attitudes towards these underlying aspects of governance opens up processes of power, giving insight into whose values count, and which images are leading governance visions. Concepts that seek to reconcile competing interests by integrating and optimising their demands offer potential, but need to be applied with explicit recognition of power relations and conflicting values.

Contributions during PhD

Peer-reviewed publications

Schutter, M.S. and Hicks, C.C. (2019)[1] Networking the Blue Economy in Seychelles: pioneers, resistance, and the power of influence. *Journal of Political Ecology*, *26*(1), pp. 425-447.

Christiansen, J. and Schutter, M.S. (2019) Riding the waves of the Blue Economy: implications for impact investors. *Journal of Environmental Investing, 8(1)*, pp. 34-43

Schutter, M.S. and Hicks, C.C. (in revision at *Conservation Biology*)[2] Speaking across boundaries to explore the potential for interdisciplinarity in ecosystem services knowledge production.

Schutter, M.S., Hicks, C.C. Phelps J, Belmont, C. (in review at *World Development*)[3] Disentangling ecosystem services preferences and held values to improve environmental governance.

Schutter M.S. The Blue Economy as Blue Modernisation. (in prep, *Marine Policy*)[4]

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Chapter 1. Introduction

Marine ecosystems are some of the most vulnerable ecosystems on the planet, and are increasingly threatened by anthropogenic pressures, leading to concern over a decline in marine biodiversity (Hughes et al. 2017). However, areas of greatest biodiversity also tend to be where people are most dependent on their natural environment but where the capacities to sustainably manage these resources are lowest (Barlow et al. 2018). As a result, biodiversity decline has the potential to directly impact human well-being (Isbell et al. 2017). It is therefore vital to design effective environmental governance that is capable of addressing multiple interlinked, but sometimes also competing, goals and interests (Kooiman & Bavinck 2013).

The evolving landscape of marine environmental governance increasingly emphasises the interlinked interests of humans and nature, as demonstrated by the concept of ecosystem services and the recently emerged blue economy. Ecosystem services are defined as "the benefits people obtain from ecosystems" (Millennium Ecosystem Assessment 2005 p. v), and thereby aim to link human well-being and ecosystem functioning through increasing awareness of the importance of biodiversity for decision-making (Ehrlich & Ehrlich 1981; Ehrlich & Mooney 1983). The blue economy has various definitions, that commonly emphasise "improvement of human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities" (The Commonwealth 2020 p. 1). The blue economy thereby purports to stem biodiversity loss through the integration of social, environmental, and economic interests (The Commonwealth 2020). The blue economy concept is centred on the notion that achieving multiple objectives at once is possible, thereby realising so-called triple win scenarios, in which the economic, environmental, and social dimension benefit simultaneously.

Ecosystem services and the blue economy are thought to together offer potential for the alignment of different interests through their emphasis on multiple and interlinked goals for environmental governance. Whilst the blue economy informs wider policy discourse, ecosystem services can be seen as the materialisation of this discourse through capturing preferences and values on the ground. However, aiming for the simultaneous optimisation of different dimensions does not guarantee alignment of values, worldviews and images within or among elements of governance, and across scale. The ecosystem services

concept tends to be directed at the system to be governed (e.g. ecosystems and resource users) (Daily 1997), whereas the blue economy concept is directed at the governing system (i.e. national governments and decision makers) (Silver et al. 2015; Silver & Campbell 2018), and although they are related, it is not clear to what extent they are capable of connecting these different scales. Therefore, the question remains whether these increasingly dominant approaches to marine environmental governance succeed in demonstrating the importance of biodiversity whilst integrating diverse social, economic, and environmental interests. Successes would suggest interaction and negotiation among actors is possible such that the long-term underlying values, which shape governance, can inform and are informed by the short-term preferences, that are time-bound, and shape management on the ground (Kooiman & Jentoft 2009).

The aim of my thesis is, therefore, to develop a better understanding of the extent to which the evolving landscape of marine environmental governance contributes to aligning the values, worldviews and images of the governing system with those of the system to be governed (Kooiman & Jentoft 2009). More specifically, in my thesis I ask whether an ecosystem service approach, which is focused on preferences, adequately captures the full range of resource users' diverse and plural values, and whether the blue economy is reflective of these values on the ground. Therefore, the contribution of this thesis is the exploration of how values, worldviews and images interact to shape governance at local, national, and international scales.

The evolving landscape of marine environmental governance

The dual pressures of environmental crises and high levels of human dependence on natural resources are particularly acute in coastal systems, particularly in the tropics (Barlow et al. 2018). As these challenges become more pronounced, segments of the academic and development communities identify opportunities in the very ecosystems that are under threat: oceans are thus increasingly described as new economic frontiers and places of development (Steinberg 2018). In claims to conserve their rich biodiversity, whilst simultaneously supporting people's wellbeing, interest has grown in the 'untapped' economic opportunities that oceans offer and their potential to address these goals (OECD 2016; The Economist Group 2018). The co-existence of challenges and opportunities for oceans have led to a considerable reorganisation of

environmental governance. Recent efforts to reconcile the multiple demands for environmental, social, and economic sustainability echo earlier approaches that build on sustainable development.

The blue economy embodies the quest for triple wins that was popularised by the sustainable development concept: it proposes policies aimed at a wide range of ocean-based activities that offer economic, social and environmental benefits. Under the influence of values of modernity, this approach to ocean governance envisions change as progress towards rational and science-based governance (Knobl 2003). Central to recent shifts in environmental governance is the assumption that environmental problems can be solved by making individuals and organisations realise how environmental sustainability contributes to their well-being (York & Rosa 2003). This assumption leads to optimism about the possibility of integrating and achieving multiple objectives at once. Contemporary approaches to environmental governance thus propose that triple wins can be achieved through embedding environmental interests into the economy and creating more efficient institutions (Jänicke 2009). The blue economy is an example of one such governance approach, which envisions moving towards markets and economic growth as a basis for overcoming environmental degradation and scarcity, with the addition of improvements in social equity (Silver et al. 2015).

The impetus for the integration of social and environmental concerns into economic growth paths was provided by challenges to the so-called 'development as economic growth' model, such as questions raised on the ecological limits to economic growth (Monni & Pallottino 2015). Sustainable development incorporated these challenges, and established the improvement of social, environmental, and economic interests as the three fundamental pillars for governance (Pepper 1999; Greig et al. 2007). The concept was popularised by the Brundtland report (WCED 1987), and keeps economic growth as an imperative, but qualifies this with social and environmental objectives, proposing "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987 p. 43). The ecosystem services concept incorporates ecological limits to growth through the demonstration of the importance of biodiversity for human well-being, thereby also placing ecological functioning within an economic framework (Gómez-Baggethun et al. 2010). The next sections discuss the blue economy and the ecosystem services concepts in more detail.

The blue economy

The blue economy has received considerable attention at the international stage, mainly focused on conceptualising the concept and discourse (Silver et al. 2015; Voyer et al. 2018). In addition, there has been publicity around advocacy by NGOs and states (UNEP et al. 2012; Chatham House 2014; WWF 2015; Abu Dhabi Declaration 2016). Increasingly, attention is shifting to implementation of the discourse, and material implications for resource users (Mallin & Barbesgaard 2020; Satizábal et al. 2020). However, it has also been argued that local implementation is a result of negotiation between competing interpretations of the blue economy (Steinberg & Kristoffersen 2018). Either way, the blue economy represents specific values, worldviews, and images. There is a need to open this process of negotiation and critically explore how local policy makers and practitioners understand and employ different interpretations of the concept.

By framing the three dimensions of sustainability as interdependent and proposing 'blue growth', the blue economy has been argued to reconfigure oceans as new development spaces (Satizábal et al. 2020), replicating the green economy in providing capital with new places to go (Brand 2012). The process of readying ocean spaces for incorporation into processes of capital accumulation has been argued to come at the cost of local resource users (Choi 2017; Mallin & Barbesgaard 2020). Imaginations of oceans as placeless areas of wilderness, which need to be tamed in order to manage them effectively (Steinberg 2001; Anderson & Peters 2014), further contribute to conceptualisation of the ocean as a place in need of rational management. As a result, the blue economy, with its optimism about a triple bottom line, has wide appeal as a 'common sense' approach to ocean governance. The incorporation of environmental concerns into paradigms of economic growth has been argued to constitute a 'passive revolution' in the Gramscian sense, whereby challenges to the current capitalist hegemonic world order are neutralised (Wanner 2015). From a belief in the necessity of continued economic growth, an integration of economic and environmental interests becomes a rational approach to optimising both.

Ecosystem services

Within discourses of sustainable development, ecosystem services present the materiality of the triple bottom line - the marine goods, services and flows that are used, managed, protected, traded and contested within a blue economy. Ecosystem services are defined as the benefits that humans derive from nature (Millennium

Ecosystem Assessment 2005), thereby linking ecosystems with human well-being. The concept emerged in the 1980s as an approach to demonstrating interdependencies between human societies and ecosystems and has become influential in environmental governance (Mooney & Ehrlich 1997; Fisher & Brown 2015). Ecosystem services thus seek to reconcile social, environmental and economic interests through providing a common language and seeking mutual benefits (Sachs & Reid 2006; Haines-Young & Potschin 2010). The 2005 MEA report was a global assessment of consequences of environmental change for human well-being and popularised the ecosystem services concept for policy making (Gómez-Baggethun et al. 2010).

In practice, the ecosystem services framework has seen a transition from a metaphor for demonstrating human dependence on ecosystems into a policy- and decision-making tool. The application of the framework often includes the use of economic methods for valuation and the design of market-based incentives. Examples are Payment for Ecosystem Services (PES) schemes, which were first introduced in Costa Rica and in which providers of ecosystem services receive compensation from those who are enjoying the services (Gómez-Baggethun et al. 2010). Examples are payments for carbon sequestration in mangroves, so-called 'blue carbon' (Locatelli et al. 2014). The potential of blue carbon as an ecosystem service, capable of attracting payments, has recently gained attention in the blue economy context of Seychelles (James Michel Foundation 2020). In addition, there have been attempts to calculate the economic value of the world's natural resources (Costanza 1997; Balmford et al. 2002). As such, the concept has been argued to have shifted from a communication tool, through monetisation, to appropriation (establishing property rights for ecosystem services to resolve market failures) and exchange (Gómez-Baggethun et al. 2010).

Critique exists that an ecosystem services approach leads to the commodification (Kosoy & Corbera 2010) and financialisation (Sullivan 2013; Asiyanbi 2017; Bigger & Robertson 2017) of nature, caused by an increased emphasis on financial markets and their role in conservation, as well as a move towards turning nature into tradable goods. The cause for these developments has been identified as narrow disciplinary framings, which disregard plural and diverse values associated with human-nature relationships (Gómez-Baggethun et al. 2010; Kosoy & Corbera 2010). However, in its essence, ecosystem services is an interdisciplinary concept, bridging natural and social sciences. In addition, there is now increasing attention

for the multiple values of ecosystem services and the diverse types of knowledge that can contribute to understanding nature's contributions to people (Díaz et al. 2018). The question is to what extent the diversity of knowledge required for balancing human and environmental needs is engaged in ecosystem services research, as this is vital for a balanced understanding of the importance of biodiversity in a blue economy context, integrating diverse social, economic, and environmental interests.

Ecosystem services have been critiqued to neglect certain values, rendering these 'invisible' in favour of a single exchange value, leading to prioritisation of monetary valuation (Kosoy & Corbera 2010). If this is the case, ecosystem services would not contribute to a balanced alignment of the different sustainability dimensions. However, values are often not clearly defined in empirical research on ecosystem services. Indeed, research into resource users' understanding of ecosystem services has tended to focus on preferences instead of the underlying values that motivate these preferences (e.g. Raymond et al. 2009; Martín-López et al. 2012). It is therefore not always clear which or whose values are under discussion. In order to identify and resolve mismatches in values there is a need to empirically study those values that have been argued to be 'invisible', whether these are indeed neglected, and if so, how.

Interactive governance theory: conceptual framework

I draw on interactive governance theory to evaluate marine decision- and policy-making. Interactions are an essential part of environmental governance in marine ecosystems, as common pool resource systems that are often characterised by legal pluralism (Bavinck & Gupta 2014). This legal pluralism introduces complexity into the system, heightened by the introduction of new approaches based on the blue economy and ecosystem services, which are layered on top of existing governance arrangements. In addition, the multiple pressures that oceans are facing, combined with the new opportunities identified, provide new challenges. Interactive governance theory recognises this complexity and provides a framework that highlights the importance of interactions between these diverse governance actors (Jentoft & Bavinck 2014).

Thus, in governing societies, interactive governance theory places an emphasis on interactions, particularly between state, market, and civil society (Kooiman & Bavinck 2005). This perspective argues that interactions between these elements of society are essential for effectively addressing societal issues and

achieving goals, but also for normative reasons, because it has the potential to democratise decision-making (Kooiman & Bavinck 2013). The legal pluralism and multiple governance approaches that are layered on top of each other provide an incoherent system that often fails to recognise the various other arrangements, thus hindering effective governance. Interactive governance theory, by focusing on the interactions between the elements of society and across the governing system, provides a way to democratise decision-making, and align divergent approaches, values, and perspectives (Kooiman & Bavinck 2005).

The interactive governance framework divides societal systems into two parts: a system-to-be-governed and a governing system, and has a focus on the interactions that take places within and between them. These two parts and their societal interactions are underpinned by values, worldviews and images (Kooiman & Bavinck 2005). These values, worldviews and images are the foundation of all decision-making, and thus constitute a critical component of the interactions between the system-to-be-governed and the governing system (Kooiman & Jentoft 2009). Therefore, it has been argued that it is essential for governance to be rooted in the relatively stable values of society, and that deliberation about these values should engage all those involved in governing interactions (Kooiman & Jentoft 2009). Effective governance therefore requires these interactions to work two ways: going back and forth between state, market and civil society actors, as well as between the system-to-be-governed and the governing system. The interactive governance framework offers a useful window to understand how decisions of the governing system interact with the system-to-be-governed. It focuses analysis on a detailed look at the inherently political processes of negotiation, that engage peoples' deeply held values, principles, and worldviews, and how these impact and are impacted by both on-the-ground processes of resource use and the institutions of the governing system (Jentoft & Chuenpagdee 2009; Kooiman & Bavinck 2013; Song et al. 2013).

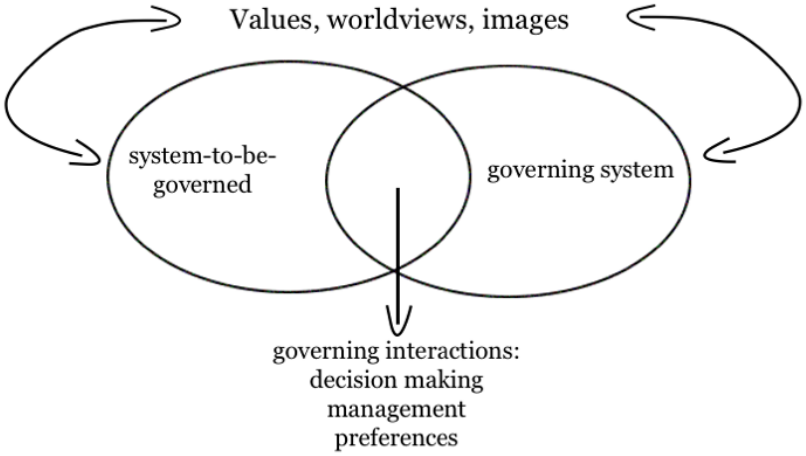


Figure 1.1 The interactive governance framework. Figure adapted from Sowman (2015).

Negotiation about the values, worldviews and images that underpin environmental governance have been argued to form the essence of governance (Song et al. 2013). Values provide information on what people find important in life and their normative ideas on how things ought to be. Values are formed at a young age, and are influenced by both shared culture and unique personal experience (Schwartz 1999). Within environmental governance, conflicts in values have been argued to be the cause of 'hard' choices, and values have been described as "normative and ethical cornerstones" of environmental governance (Kooiman & Jentoft 2005 p. 298). Worldviews translate values into preferred mechanisms of government, influenced as they are by values around human-nature relationships and ideas about what constitutes valid knowledge (Sowman 2015). Images are conceptions of reality, and thus give insight into the way that people see the world, but also make people act according to these images. Thus, dominant discourses in environmental governance can create powerful images of the system-to-be-governed, and of the approach needed in the governing system to successfully address goals and issues, thereby shaping reality itself (Song et al. 2013).

The role of power in interactive governance is not only expressed in the dominance of images, but also in values, worldviews and images considered in governing interactions: hegemony of one group might mean the suppression of others (Song et al. 2013). In addition, power dynamics affect processes of learning in

environmental governance, as it has the ability to determine what counts as valid knowledge (Kooiman & Jentoft 2009; Sowman 2015). Power can be traced in social interactions and its dynamics take place at different scales: international discourse obtains its power from persuasion and consent, and processes of negotiation on which values, worldviews and images are valid offer insight into these dynamic relations (Gramsci 1971; Cox 1983). In addition, power dynamics take place at a local scale, where they are making things happen in day-to-day interactions, and thus can be traced by following *what* they are allowing to happen (Lipschutz 2005; Foucault 2010).

Assessing interactive governance

Through a focus on values, worldviews and images in environmental governance, I evaluate the extent to which ecosystem services and the blue economy enable interaction between the elements of society. Ecosystem services take place at the site level, within the system-to-be-governed, whereas the blue economy is a powerful discourse in the governing system. In my thesis, I view ecosystem services as the attempt to demonstrate the importance of biodiversity, within the wider context of the blue economy, which aims to integrate social, economic and environmental interests. The ecosystem services concept is intended to capture the value of nature to humans, thereby connecting everyday resource use with underlying values (Daily 1997). In my thesis, I examine the site-level, the national, and the international scale at which ecosystem services and the blue economy are manifested, and ask to what extent these scales interact to contribute to effective environmental governance. In chapters two and three, I ask to what extent the knowledge and worldviews available in ecosystem services research reflect a wide range of diverse and plural values, and to what extent people's preferences for specific ecosystem services offer insight into the underlying values that people hold. In doing so, I identify a need for broader involvement of disciplinary knowledge, and wider consideration of values in deliberative decision-making. Following this in chapter four, I establish perspectives on the blue economy within Seychelles, and ask how these relate to international discourse. Finally, in chapter five I examine the linkages between the power of worldviews and images in international blue economy discourse and local power within the national governing system and governing interactions.

I examine the development of ecosystem services and the blue economy concepts in detail, using different tools and approaches, allowing exploration of these concepts from different angles, including how values and power play a role in environmental governance across the site-level, the national and the international scale. To this end, I consider the case study of Seychelles as it is placed in the wider context of ecosystem services and blue economy. Each of my chapters engages with one or more of the different levels of governance as proposed by the concept of interactive governance, with a focus on the extent to which there is interaction across scales.

Thesis structure

In **Chapter 2** I ask to what extent the knowledge produced within ecosystem services research reflects a wide range of diverse and plural worldviews. Worldviews are considered an important topic of negotiation in environmental governance, and determine to a large extent the epistemologies of the people involved (Sowman 2015). If ecosystem services research is to inform broad consideration of the importance of different aspects of the environment, then there should be space for a variety of disciplines with different epistemologies to be involved in the production of knowledge on these aspects, and they should be communicating with each other. Earlier reviews have focused on the content of knowledge produced in the ecosystem services field, and the disciplines involved (Chaudhary et al. 2015; Droste et al. 2018; Martín-López et al. 2019). I contribute to existing research through a focus on knowledge production and communication crossing disciplinary boundaries, measured by citations between journals.

Chapter 3 situates ecosystem services on the ground within a blue economy context. In this chapter I ask to what extent people's preferences for specific ecosystem services offer insight into the underlying values that people hold, thereby linking the system-to-be-governed with the governing system. Ecosystem services were intended to demonstrate the importance of biodiversity to people, and therefore should capture the underlying values that motivate people's preferences for ecosystem services, especially in the context of interaction and negotiation in environmental governance. It is therefore necessary to know whether collecting preferences for specific ecosystem services provides adequate insight into underlying values of resource users. Empirically clarifying the link between preferences and values also allows for the exploration of 'invisible' values (Kosoy & Corbera 2010). Knowing the underlying values of ecosystem services also

allows for identifying and resolving potential mismatches in values between the system-to-be-governed and the governing system. This chapter connects resource users' preferences and values with the overarching values that the blue economy supports, but also with the primary institutional tool of the blue economy - the Marine Spatial Plan that maps use and benefits from ecosystem services (Seychelles Government et al. 2017). It has been argued that because preferences are "reason-blind" (O'Neill 2007 p. 28), there is a need for deliberation, in which environmental values are explicitly discussed. In Seychelles, the potential for deliberation is present in the Marine Spatial Planning process. If policy and management are to be aligned with other levels of governance and values of resource users, knowing *why* people prefer certain services over others is paramount for effectively addressing goals of environmental governance. In addition, knowing resource users' values enables balanced evaluation on the types of values introduced by new governance concepts such as the blue economy, and whether these align with local value structures.

The blue economy as a governance concept is further explored in **Chapter 4.** The images that underpin governance are important, because they not only define how people see the world, but they also shape reality directly, because people act according to these images (Song et al. 2013). The blue economy discourse has the potential to be a powerful image in the governing system, resulting in decisions that fit these images of the blue economy. The blue economy, with its triple bottom aims therefore appears to be very well suited for achieving interactive governance, because it gives a voice to the environmental, economic and social dimension. Blue economy thus seeks to ensure participation and recognition of diverse interests, but interaction and explicit deliberation on the images and interpretations of the blue economy does not follow automatically. I examined policy makers' and practitioners' perspectives on the blue economy to assess how competing interpretations are reconciled, and asked whether international critical perspectives are mirrored on the ground. Building on fieldwork in Seychelles, this chapter examines the extent to which different national perspectives have agency in national networks of influence, and assesses the capability of Seychelles to shape the blue economy itself. Thereby, this chapter has a focus on the governing system and the perspectives of the actors within it, and it links this with the international level, where values and worldviews are negotiated in international blue economy discourse.

Chapter 5 further examines linkages between the international power of discourses about the blue economy concept and local power within the national governing system and in governing interactions. This chapter considers the persuasive power of the blue economy narrative and links international discourse to local implementation by approaching power in two ways. First, I discuss the power of the blue economy discourse ideology for maintaining and extending capitalist hegemony, enrolling places like Seychelles through awarding international recognition and influence. In order to maintain this recognition and influence, the concept needs to be maintained on the ground as well, which happens through social power relations that negotiate the implementation of the blue economy. These negotiations take place at the national scale, where the values, worldviews and images of the blue economy concept are decided upon, but take shape through the actors in the governing system and their interactions with the system-to-be-governed. I identify the specific tensions and trust-related issues that shape social relations and enable the passive revolution of the blue economy to land in Seychelles.

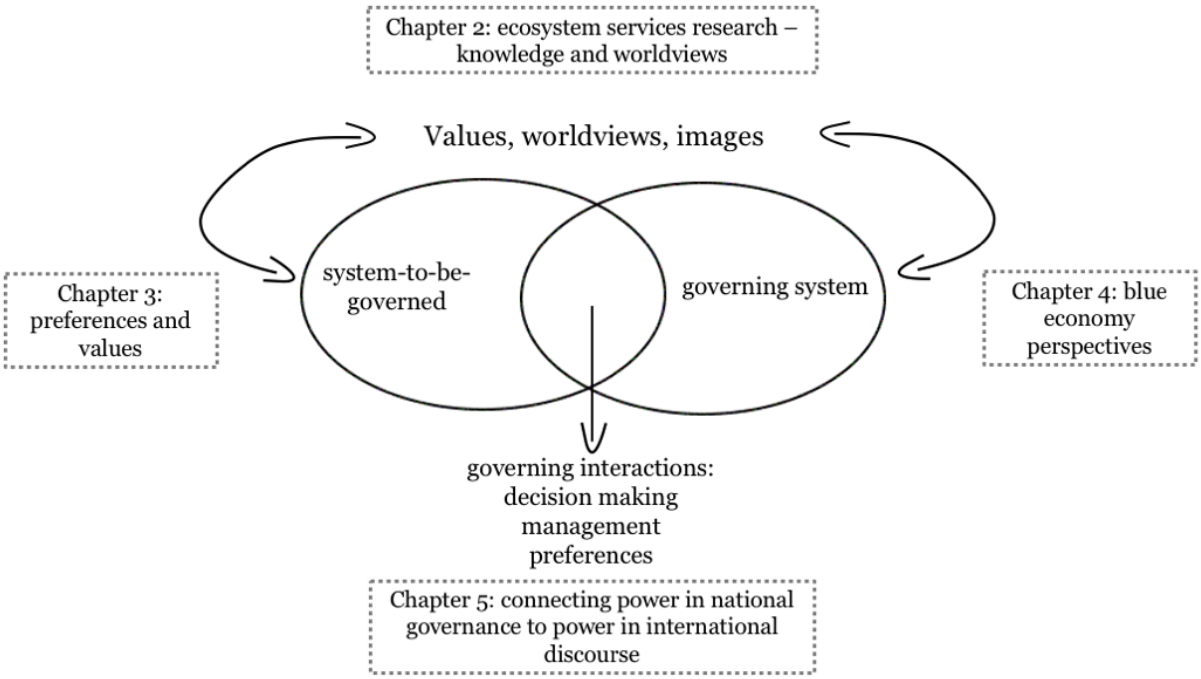


Figure 1.2 Thesis chapters and their relation to the interactive governance framework. Chapter 2 examines to what extent knowledge and worldviews available in ecosystem services research reflect a wide range of diverse and plural values. Chapter 3 examines to what extent people's preferences for specific ecosystem services offer insight into the underlying values that people hold. Chapter 4 establishes perspectives on the blue economy within Seychelles, and examines how these relate to international discourse. Chapter 5

examines the linkages between the power of worldviews and images in international blue economy discourse and local power within the national governing system and governing interactions.

Study region

Seychelles is an island nation in the Western Indian Ocean, with a population of 96,762 in 2018 (The World Bank 2018). Seychelles consists of 115 islands in an Exclusive Economic Zone of 1.3 million km2. Three granitic islands, Mahé, Praslin, and La Digue are the main islands with human habitation, with the rest of the atolls, granitic and coralline islands sparsely inhabited (Robinson et al. 2006). Seychelles is culturally and economically dependent on its diverse coral reefs (Clifton et al. 2012). For example, fisheries and tourism contribute 8% and 23% to GDP, and 10% and 19% to employment (The World Bank 2017). In addition, small-scale artisanal fisheries form an important part of Seychellois culture and a major contributor to Seychelles' food security (Clifton et al. 2012). The artisanal fishing sector traditionally used wooden pirogues, which have been replaced with small fibreglass vessels called mini-Mahé and whalers and larger schooners, that use a variety of gears, such as handlines, traps, gill nets, beach seines, and harpoons (Bijoux 2015; Seychelles Fishing Authority 2019). In light of the social economic, and cultural importance, it is worrying that Seychelles' reefs are particularly vulnerable to the increasingly severe and frequent effects of climate change (Graham et al. 2015).

Figure 1.3 Map of Seychelles (mapsopensource.com 2020)

Seychelles remained uninhabited until 1770, when French settlers arrived and colonised the islands, although they had been seen and stepped upon before. The French ruled in Seychelles, importing creole slaves from Mauritius to work on spice plantations, until 1814, when the British took over (Scarr 2000). The continuous influx of slaves from not only Mauritius, but also from the East African coast, as well as Chinese and Indian traders settling in Seychelles, has meant that the population is very diverse until today, with mixed African, French, Indian, Chinese and Arab backgrounds (The Commonwealth 2010). This diversity is also expressed in the languages of Seychelles: Creole, English and France are the three official languages, with Creole the most widely used one (Commonwealth 2010). In 1976, Seychelles became independent, with a multi-party constitution. However, in 1979 Seychelles became a one-party state and remained so until 1993, when another new constitution introduced multi-party democracy (Commonwealth 2010). However, also after 1993 the same ruling party has continuously been in power, although in the most recent parliamentary elections the opposition party secured a majority of seats in the National Assembly, for the first time since 1979 (Uranie et al. 2016).

Seychelles' unique colonial history, its diverse and egalitarian character and the role of tourism in the country has meant that it is an accessible place to do research. These circumstances, combined with the country's good infrastructure, mean that many studies have been done in Seychelles, and some of the fishers that I spoke with expressed some 'research fatigue'. However, this also meant that I had easy access to respondents, as many people were used to answering questions and happy to share their views. The small scale of the country means a decided lack of hierarchical structures, and I was able to quickly connect to high-level diplomats and other decision-makers, who all had a friendly attitude towards me as a PhD researcher. This allowed me to get acquainted with these actors easily and informally and get invited to social functions too. At the same time, this was a benefit derived from the timing of my visits, as they were precisely in between election periods. Recent economic and political changes have meant an increase in tensions around the blue economy specifically, as it has become a debated topic in the context of the upcoming 2020 elections.

Marine environmental governance in Seychelles takes place in close collaboration between the state and environmental Non-Governmental Organisations (NGOs). NGO's became increasingly important after a major macro-economic restructuring in 2008, which necessitated a reduction in government spending, and the opening up of Seychelles' market to international competition and trade (Clifton et al. 2012). This restructuring created an opportunity for Seychelles to become a pioneer in pushing a blue economy agenda, which included the establishment of a Department of Blue Economy (Seychelles Nation 2015). The blue economy has also inspired new ways of finance, including the world's first oceanic debt-for-nature swap (The Nature Conservancy 2017; Silver & Campbell 2018). This resulted in the creation of the Seychelles Conservation and Climate Adaptation Trust (SeyCCAT), whose goal is to "competitively grant at least US$ 750,000 per annum [or 0.044% of 2018 GDP (The World Bank 2018)] to support the stewardship of Seychelles' ocean resources, island life and blue economy" (The Seychelles Conservation and Climate Adaptation Trust 2019).

The primary tool facilitating interaction and dialogue among actors and across scales in Seychelles' contemporary marine governance is a Marine Spatial Plan (MSP), which involves stakeholder consultations to identify and map potential benefits from the different zones in the Seychelles Exclusive Economic Zone

(EEZ) (Seychelles Government et al. 2017; Schutter & Hicks 2019). The separate maps serve as layers in a spatial planning process that results in the designation of different marine zones (highly protected, medium protected and sustainable use, and multiple use zones) (Seychelles Government et al. 2017). The country has received technical assistance for the MSP process from international NGO The Nature Conservancy (TNC), who were also involved in brokering the debt-for-nature swap in 2015 (Seychelles Marine Spatial Planning Initiative 2014; Silver & Campbell 2018). In 2020, Seychelles successfully expanded the area of its Exclusive Economic Zone designated as prohibited to fishing from 0.04% to 30% (410,000 km^2) through this process (The Nature Conservancy 2020).

Because of recent shifts in values and approach to economic and environmental governance, Seychelles presents an interesting case to study the relationships between policy, preferences, and values. Seychelles' political economy has recently undergone considerable neoliberal restructuring from a previously socialist country with a largely closed economy (Bulbeck 1984). These changes have been particularly pronounced in Seychelles approach to marine governance which has reoriented to enthusiastically engage with the blue economy (Silver et al. 2015, Schutter & Hicks 2019). The blue economy plays a role in framing and shaping the governance landscape in Seychelles, bringing values, principles, worldviews and images that interact with the more practical and timebound day-to-day management.

Chapter 2. Speaking across boundaries to explore the potential for interdisciplinarity in ecosystem services knowledge production

2.1 Abstract

Environmental governance is likely to be most successful if it draws on knowledge from across the natural and social sciences. The ecosystem services concept has been termed a boundary object, facilitating the development of such interdisciplinary knowledge through a common platform for researchers, policy makers, and practitioners. However, critique of the concept has focused on narrow disciplinary framings that counteract its original interdisciplinary aspirations. A question that remains is to what extent these critiques are reflected in a (lack of) disciplinary diversity within the field of ecosystem services. Here, I ask 1) where is knowledge on ecosystem services produced? 2) how interdisciplinary is this knowledge? And, 3) which disciplines facilitate the greatest disciplinary integration? I define interdisciplinarity as the extent to which published research draws on knowledge that crosses disciplinary borders, and use citations as a quantitative indicator of communication among disciplines- based on journal classification. I use diversity, richness, and hetero-citation as a measure of interdisciplinarity, and betweenness centrality for disciplinary integration. I find that: 1) the field of ecosystem services research has matured and grown to publish more articles, across more disciplines, in an increasingly dense network of citations, however; 2), this growth has not been mirrored by an increase in the diversity or richness of citation patterns; 3) hetero-citation scores for Arts, Humanities, Social Sciences and Law (AHSSL) are lower than would be expected, but they are beginning to bridge the gap with Science, Technology, Engineering and Mathematics (STEM); 4) a small number of productive disciplines support disciplinary integration. I find that there is an opportunity for conservation practice to draw on a broader field of research, to realise the potential that the diverse body of knowledge of interdisciplinary work has to offer.

2.2 Introduction

Biodiversity levels worldwide are declining at unprecedented rates (IPBES 2019), with both terrestrial and marine ecosystems exposed to the impacts of human induced climate change, pollution, and overexploitation (Pereira et al. 2012). These developments are both caused by, and negatively impact people (Isbell et al. 2017); impacts that are exacerbated by the fact that areas where people rely most heavily on their natural environment tend to be those ecosystems that are hit the hardest (Barlow et al. 2018). Effective conservation and sustainable use of biodiversity is therefore a critical contemporary concern, but requires support from a variety of actors from different backgrounds (Sandbrook et al. 2011, 2013).

Ecosystem services emerged in the 1980s and has since become a key concept in environmental policy and practice (Fisher & Brown 2015). Ecosystem services seeks to demonstrate the interdependencies between human societies and ecosystems by highlighting the myriad ways in which nature contributes to human well-being (Mooney & Ehrlich 1997). Thereby, the concept can serve to find common ground in mutual benefits: demonstration that biodiversity enhances ecosystem services and thereby human wellbeing should raise societal support for biodiversity conservation (Haines-Young & Potschin 2010). Through its focus on linkages between ecosystem functioning and human well-being ecosystem services seek to draw on a diversity of disciplines to balance social, environmental, and economic interests (Sachs & Reid 2006). Consequently, ecosystem services have been termed a 'boundary object' (Star 1989; Steger et al. 2018), providing a common platform for researchers, policy makers, and practitioners from diverse disciplines and backgrounds to coalesce (e.g. IPBES (Díaz et al. 2015) and ESPA (Daw *et al.*, 2011, 2015)).

However, work that crosses disciplinary boundaries is challenging, particularly since disciplines embody very different accepted ways of knowing, doing and writing (Carter 2007). Thus, despite a considerable body of research on ecosystem services that employs a diversity of methods (Martín-López et al. 2019), to tackle interdisciplinary topics (Droste et al. 2018), in a diversity of disciplines (Chaudhary et al. 2015), a lack of social science engagement is thought to limit its interdisciplinary potential (Chaudhary et al. 2015; McDonough et al. 2017; Martín-López et al. 2019). Some further argue that the field has been co-opted by narrow disciplinary framings, leading to a focus on monetary valuation and payment schemes that

commodify nature rather than fulfil aspirations to protect it (Gómez-Baggethun et al. 2010; Kosoy & Corbera 2010; Stoeckl et al. 2018). Research on ecosystem services has been suggested to suffer from a lack of common understanding between multiple disciplines, leading to challenges for collaboration and reduced adoption in policy and practice (McDonough et al. 2017).

Although supportive and critical evaluations exist on the interdisciplinary scope of ecosystem services research, both have tended to focus on the content of a selection of published articles, leaving unclear the full extent to which disciplinary diversity is reflected in the field. Here I address this gap, using citations to measure the flow of knowledge among disciplines based on the assumption that interdisciplinary research is research that draws on knowledge produced in a diversity of disciplines. Specifically, I ask: 1) where is knowledge on ecosystem services produced? 2) how interdisciplinary is this knowledge? And, 3) which disciplines facilitate the greatest interdisciplinary integration?

2.3 Methods

I define interdisciplinary research as research that draws on knowledge from across disciplinary boundaries; I am therefore interested in the flow of information among disciplines (Hicks et al. 2010). Scholarly journals reflect disciplinary traditions in formal communication, working practices, and underlying bodies of knowledge (Becher 1987). Scientific communications, through citation patterns, reproduce cognitive structures that inform a discipline's research vis-à-vis other disciplines (Vincenot 2018). Therefore, studying patterns of citations among disciplines provides information about the flow of knowledge among disciplines, and the extent of interdisciplinary knowledge production (Leydesdorff 2007). I use citations as an indicator of this flow, assuming that an article cites another article when there is relevant information to inform or support the new knowledge produced (Garfield 2004; Moed 2005). I used the Web of Science journal classification scheme (Clarivate 2020) to assign disciplines.

Where is knowledge on Ecosystem Services produced?

To establish where knowledge on ecosystem services is produced, I identified all disciplines, based on journal classification, that have published on ecosystem services over the past 30 years. I focus my analysis on three time periods reflecting key developments in ecosystem services (Chaudhary et al. 2015; Droste et al. 2018): **1983-2000** represent the 'early years' and aligns with the first implementation of PES in Costa Rica;

2001-2010 represents a period of 'global uptake and rapid growth in disciplines', during which the 2005 MEA synthesis report was published, and; **2011-2018** represents a period of 'institutionalisation and rapid growth in publications', and the formation of the IPBES (Chaudhary et al. 2015; Droste et al. 2018). I used the SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, and ESCI databases in the Web of Science (WoS) search engine with the search query "ecosystem services" to identify all articles published in English with this phrase in their keywords, abstract, or title. I identified 26,306 journal articles, published between 1983 and the end of 2018. I exported data on authors, year of publication, journal, and full reference lists for all articles, yielding a total of 22,153 complete entries.

Next, I assigned each citing article and cited references to a research discipline, based on the WoS journal classification scheme, using R package "bibliometrix" (Aria & Cuccurullo 2016). The function metaTagExtraction in this package extracts the source (journal) of each cited reference. I then used lookup tables and the WoS classification scheme of journals into research disciplines (list obtained from Clarivate Analytics Technical Support) to replace journal names with their primary research disciplines. Clarivate allocates journals to 254 subject categories (hereon disciplines) based on journal citation patterns, journal titles, keywords, and user feedback (Katz & Hicks 1995; Clarivate 2020). The category scheme is continuously monitored and managed by editors to maintain relevance, logical content relationships, and respond to feedback particularly with respect to new specialty areas (Boletta 2019). The processes of article submission and peer review, and the resulting journal in which articles are published, constitutes a selection procedure that affects structures of disciplinary knowledge (Leydesdorff 2007), these disciplinary categorisations are thus also shaped by academics. The Clarivate classification scheme is only one approach to classifying journals into disciplines and is necessarily subjective, but provides the narrowest categorisation with the highest level of detail available (Clarivate 2020). Notwithstanding shortcomings of such an approach, the existence of an accepted and established system for classifying journals into research disciplines offers a sufficiently robust foundation to evaluate the flow of information among discrete disciplinary groupings.

Finally, I quantified the number of unique disciplines cited in each year, and the proportion of those that were STEM (Science, Technology, Engineering, and Mathematics) versus AHSSL (Arts, Humanities, Social Sciences, and Law) disciplines.

How interdisciplinary is this knowledge?

To establish the interdisciplinarity of knowledge produced within the ecosystem services field, for each *citing* discipline I calculated the average number and diversity of disciplines *cited* in an article. I organised my data by creating an adjacency matrix of citing to cited disciplines using R package "igraph" (Csardi & Nepusz 2006) and then created an edgelist, connecting each citing and cited discipline, weighted based on the number of times a discipline had been cited by each discipline. I used this structure for each discipline and year in the complete database, to first calculate the average number of disciplines cited per article; and second, to calculate the average diversity of disciplines cited per article (Equation 1) based on Simpsons diversity index in R package "vegan" (Oksanen et al. 2017). The Simpson index runs from 0 – 1, with 1 being the highest possible diversity. I chose Simpsons diversity index, over for example Shannon's index of diversity (Dejong 1975), because I was interested in how evenly citations were distributed across the cited disciplines.

$$Diversity = 1 - \frac{\sum n(n-1)}{N(N-1)}$$

where for each individual published article

n = number of citations (mentions) of each discipline by the article

N = total number of citations coming from that article

Equation 1: disciplinary diversity

For each publishing discipline and year, I calculated the number and diversity of cited disciplines to track developments in interdisciplinarity over time.

I calculated two measures (share and balance of hetero-citations) of the flow of information between two broad disciplinary groupings, or corpora (AHSSL and STEM) for the whole field. A hetero-citation is defined as a reference in one corpus to a paper in the other, e.g. a citation going from a STEM discipline to

an AHSSL discipline (Vincenot 2018). If the ecosystem services concept is facilitating communication between these two corpora, one would expect STEM citations in AHSSL publications, and vice versa, and thus several hetero-citations in the database. I calculated the hetero-citation share (HCS) (i.e. the proportion of all citations that are hetero-citations) for each corpus, by consolidating the adjacency matrices for each year (see below), counting the total number of citations coming from each corpus in each year, and calculated the proportion that went from one corpus to the other.

Next, I calculated deviation of the HCS from expectation based on the size of each corpus in each year. I first used the relative size of the STEM and the AHSSL groups to calculate the share of citations each corpus would receive if distributed at random (i.e. share of citations is proportional to the number of publications). This is based on Vincenot (2018, p.9), stating that "The rationale underlying this metric is that, when X and Y [here STEM and AHSSL] form a completely unified discipline inside which authors are acquainted with all publications, irrespectively of the corpus they belong to, papers include a share of references to each corpus consistent with the latter's relative size." I performed a Fisher's exact test for each corpus (STEM/AHSSL) and each year, to check for significant deviations from the expected HCS.

Which disciplines facilitate the greatest disciplinary integration?

To establish which disciplines facilitate the greatest disciplinary integration across the field of ecosystem services, I used network analysis, based on citation patterns, to examine the flow of information across disciplinary boundaries. For each citing discipline (node) in the ecosystem services network I calculated a measure of betweenness centrality. Betweenness centrality is a measure of how often a node (discipline) is on the shortest path between two other nodes (disciplines) in a network (Freeman 1977). A discipline with a higher betweenness centrality is likely to connect disciplines, through its citations, that are otherwise unconnected – thus potentially playing an important role in the flow of disciplinary knowledge and having an influence over other disciplines (Freeman 1979). Betweenness centrality has been used for assessing interdisciplinarity in bibliometric analysis before because it offers insight into how visible a discipline is in the broader citation network (Leydesdorff 2007; Barnett et al. 2011). This is especially relevant in the present study, where I was interested in the flow of knowledge among different disciplines. I used the function NetworkAnalyzer in CytoScape (Assenov et al. 2008) to calculate normalised betweenness

centrality metrics for each citing discipline in each time period, based on directed networks (that includes connections from citing to a cited discipline, and not vice versa).

I used NetworkAnalyzer again to calculate a network clustering coefficient (average of all nodes) as a density measure of the entire network. The clustering coefficient is a normalised score that represents that number of edges between a node and its neighbours as a proportion of the maximum number of edges that could possibly exist between a node and its neighbours (Max Planck Institute for Informatics 2014). A network with a higher coefficient tends to be more connected, reducing the influence any individual discipline may have.

I plotted the ecosystem services citation network in CytoScape, using a Prefuse Force Layout algorithm (Shannon et al. 2003; Assenov et al. 2008). To focus on greatest roles in disciplinary integration, I plotted only those connections that together constituted the top 95% of the total weight of connections for that time period. I identified the most important disciplines in facilitating disciplinary integration, based on betweenness centrality.

2.4 Results

Where is knowledge on Ecosystem Services produced?

The number of articles published per year that contain the phrase "ecosystem services" in their title, abstract, and/or keywords has increased rapidly in the last three decades. From the first appearance in 1983, the field has grown to 3,566 articles in my database for 2018 alone (Figure 2.1a). With an average yearly growth rate of 33.8% since 2005 (when numbers first exceeded 100 articles), publications on ecosystem services have grown considerably faster than the 8-9% growth identified for scientific output overall (Bornmann & Mutz 2015). Articles on ecosystem services are published by both STEM and AHSSL disciplines. Biology was the first STEM discipline to publish on ecosystem services in 1983 (Ehrlich & Mooney in Bioscience (1983)), and in 1997, Law was the first AHSSL to publish on ecosystem services (Salzman (1997), in Ecology Law Quarterly). The number of different disciplines engaging in the field has also increased year on year, with 77 unique disciplines publishing on the topic in 2018 (Figure 2.1b).

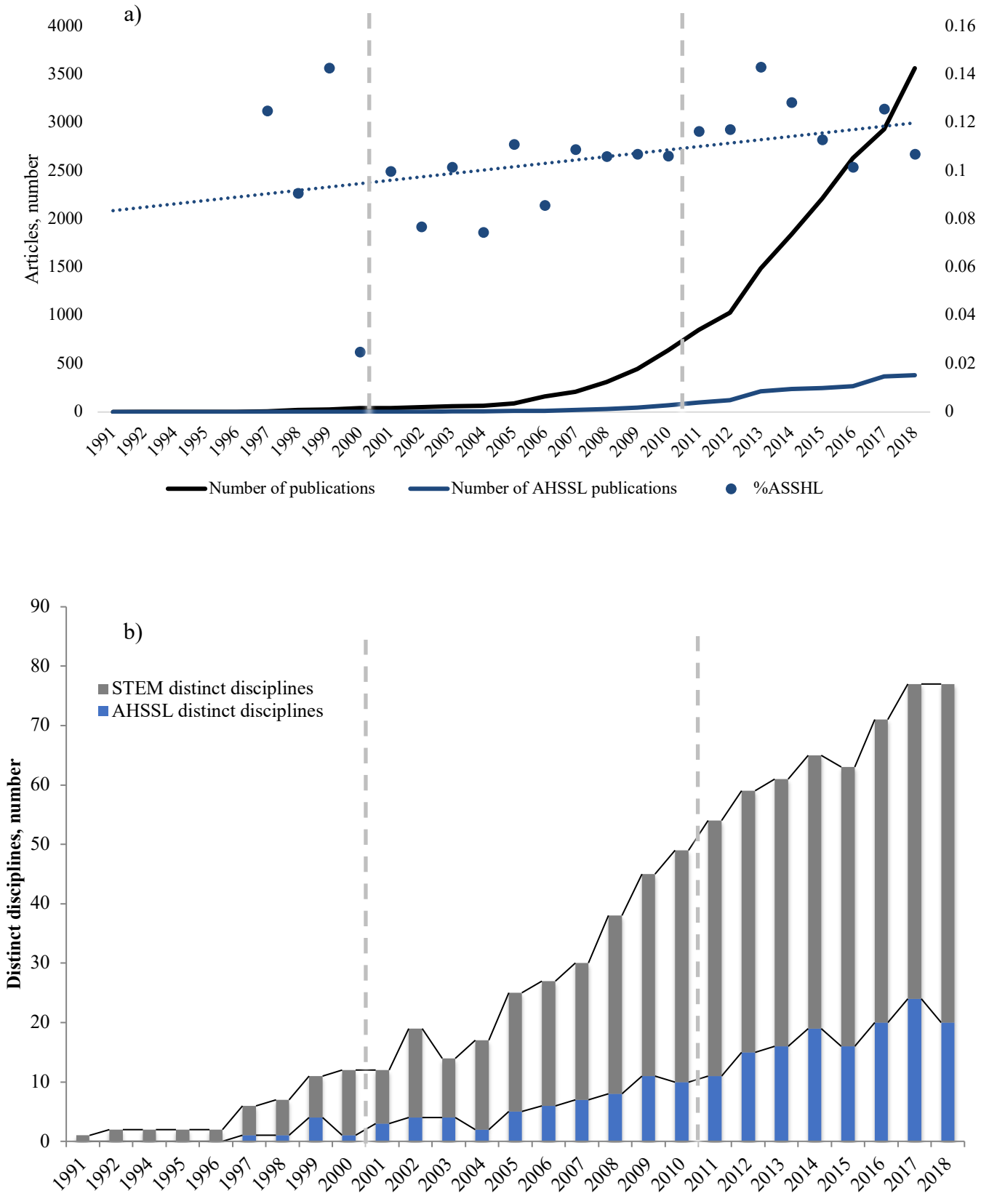


Figure 2.1 a) number of published articles, b) number of disciplines publishing on ecosystem services through time. Dotted vertical lines indicate transitions between three phases: 1983-2000 ('early years'), 2001-2010 ('global uptake and rapid growth in disciplines'), 2011-2018 ('institutionalisation and rapid growth in publications')

Over the years, Environmental Sciences and Ecology have prevailed as key publishing disciplines, along with Forestry, Environmental Studies, Multidisciplinary Sciences, Biodiversity Conservation, Geography, and Biology (Table 2.1). In terms of relative production, Environmental Sciences has grown from ~14% in the first two periods to 22.5% in the most recent network, making it the most productive discipline in the most recent years (Table 2.1). Ecology's relative contribution started off high, producing more than 37% of all publications in early years. Its relative output has declined since, to 30.3% in the middle period and 20.1% in more recent years. The only two AHSSL disciplines in the top 10 productive disciplines are Environmental Studies and Geography. The number of both STEM and AHSSL disciplines engaging in ecosystem services research has increased, however the proportion of AHSSL disciplines relative to STEM disciplines, after fluctuating in earlier years due to small numbers, has remained relatively stable in more recent years (since 2010) at 10-14% (Figure 2.1b).

	2011-2018	2001-2010	1983-2000
Environmental Sciences	22.5%	14.2%	14.3%
Ecology	20.1%	30.3%	37.8%
Forestry	6.2%	3.6%	0.8%
Environmental Studies	5.0%	3.7%	0.8%
Multidisciplinary Sciences	4.8%	4.0%	1.7%
Biodiversity Conservation	3.9%	6.8%	5.0%
Geography	3.6%	3.3%	2.5%
Biology	2.7%	5.3%	4.2%
Engineering	2.6%	2.4%	6.7%
Water Resources	2.5%	1.6%	0.0%

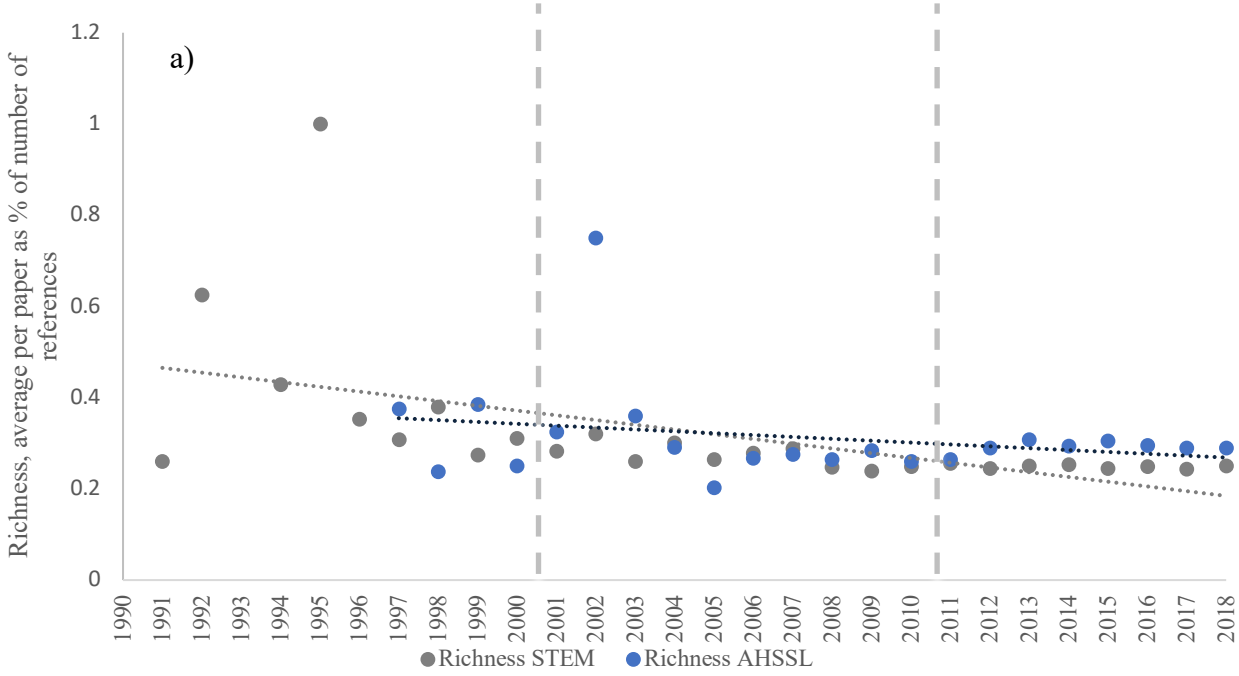
Table 2.1 Output per discipline relative to total number of ecosystem services publications per time period

How interdisciplinary is this knowledge?

The richness of STEM and AHSSL citation patterns has remained relatively similar through time with variability between years decreasing (Figure 2.2a). Although the number of disciplines each article is citing and the number of references per article have increased through time, the average number of disciplines

cited, relative to the number of references in an article, has remained around 0.35 since ~2006. In 2018, on average, AHSSL disciplines cited 12.64 disciplines across of 43.73 references per article and STEM disciplines cited 12.23 distinct disciplines across 48.93 references per article. Therefore, the number of references does not seem to bias richness.

The diversity of STEM and AHSSL citation patterns has also remained similar through time with variability through years decreasing (Figure 2.2b). The average diversity of citations in articles published in both AHSSL and STEM disciplines has remained high (~0.8) and steady since 2006; although there was greater variance in earlier years for both STEM and AHSSL, most years range from 0.7 to 0.9.



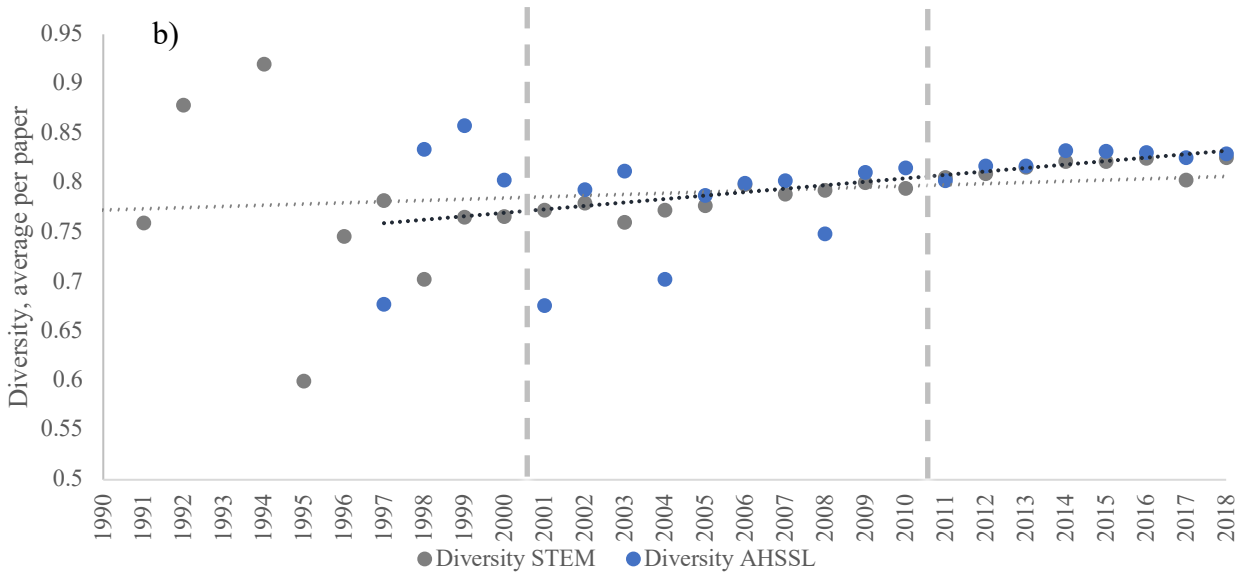


Figure 2.2 a) average richness scores as proportion of total number of references per publication for STEM and AHSSL disciplines, per year. Richness indicates the number of unique disciplines cited by each article. b) average diversity scores for STEM and AHSSL disciplines, per year. Diversity indicates the distributions of citations over unique disciplines. A score of 1 indicates that each of the citations coming from an article are going to a different discipline. Dotted vertical lines indicate transitions between three phases: 1983-2000 ('early years'), 2001-2010 ('global uptake and rapid growth in disciplines'), 2011-2018 ('institutionalisation and rapid growth in publications')

The hetero-citation share for STEM disciplines has remained relatively stable through time, fluctuating between 7% to 12% (Figure 2.3a), indicating 7% to 12% of citations from STEM disciplines go to AHSSL disciplines. For AHSSL disciplines, the hetero-citation rate is much higher: since 2005 it has fluctuated between 56% and 64%, suggesting the majority (>56%) of citations from AHSSL disciplines go to STEM disciplines (Figure 2.3a). Prior to 2005, there was more variability in the hetero-citation share due to the small number of AHSSL publications (<10).

There are far more STEM than AHSSL publications, and therefore there is a greater probability that any publication on ecosystem service will cite STEM journals. The hetero-citation balance calculates the deviation of the hetero-citation share from what would be expected based on the size of each corpus (Figure 2.3b). The STEM corpus deviates very little from the expected hetero-citation share (~0), thus citing as many

AHSSL disciplines as would be expected. Conversely, the hetero-citation balance for AHSSL is mostly negative, indicating AHSSL articles cite fewer STEM disciplines than would be expected based on the size of the STEM corpus. With the exception of 1998, the AHSSL disciplines collectively cite between 74% (in 2001) and 7% (in 2003) fewer STEM disciplines than the size of each corpus would predict (Figure 2.3b).

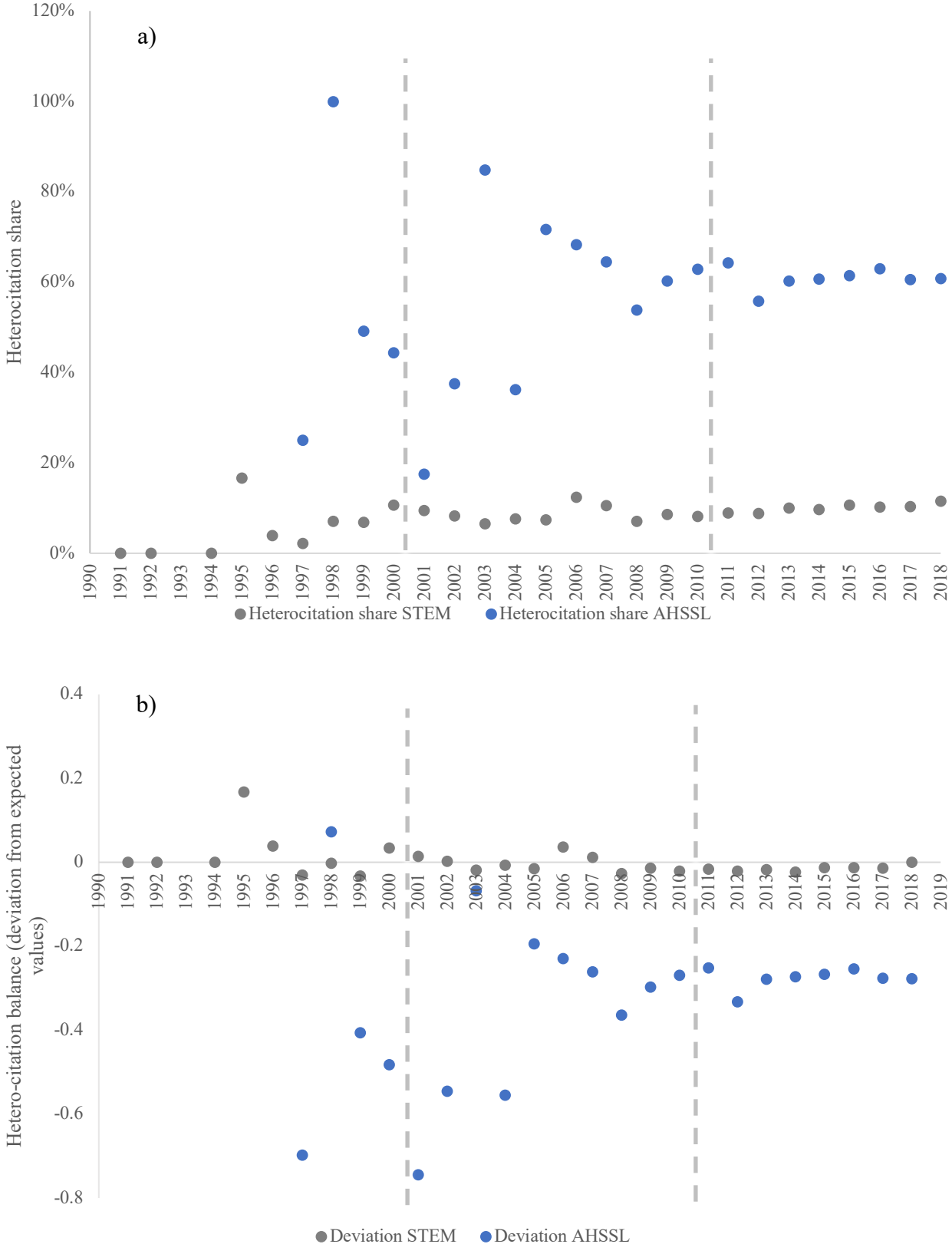


Figure 2.3 a) hetero-citation share per corpus. The hetero-citation share is calculated by counting the number of citations going to the other corpus (i.e. citations going from STEM disciplines to AHSSL disciplines, and citations going from AHSSL disciplines to STEM disciplines), and dividing this by the total number of outgoing citations. b) hetero-citation balance. The hetero-citation balance is calculated by comparing the

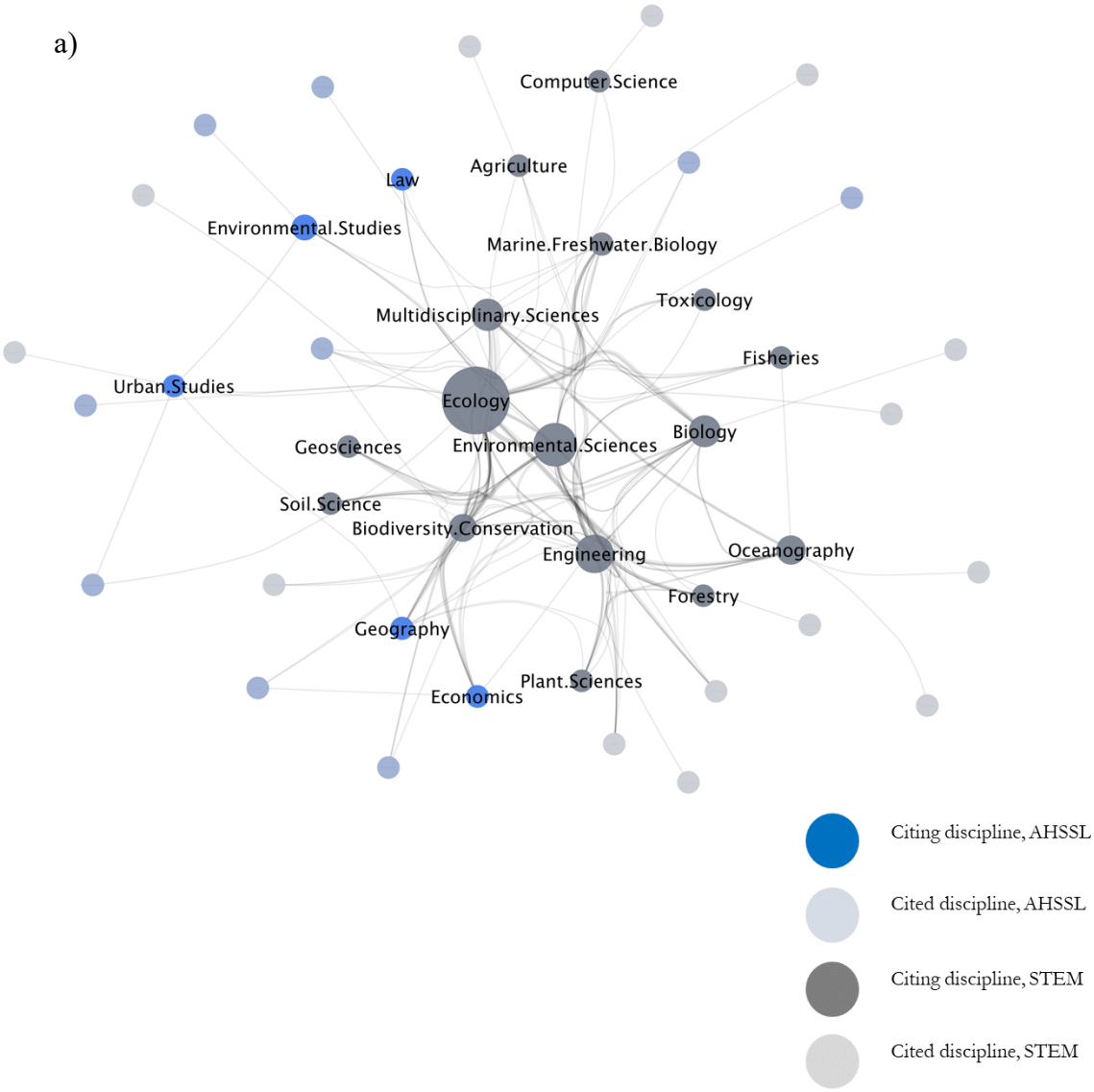
hetero-citation share to the proportion of each corpus in the total production of ecosystem services articles. The size of each corpus is the share of citations that each corpus would be expected to receive. The deviation from this proportion is shown in the graph. Dotted vertical lines indicate transitions between three phases: 1983-2000 ('early years'), 2001-2010 ('global uptake and rapid growth in disciplines'), 2011-2018 ('institutionalisation and rapid growth in publications')

Which disciplines facilitate the greatest disciplinary integration?

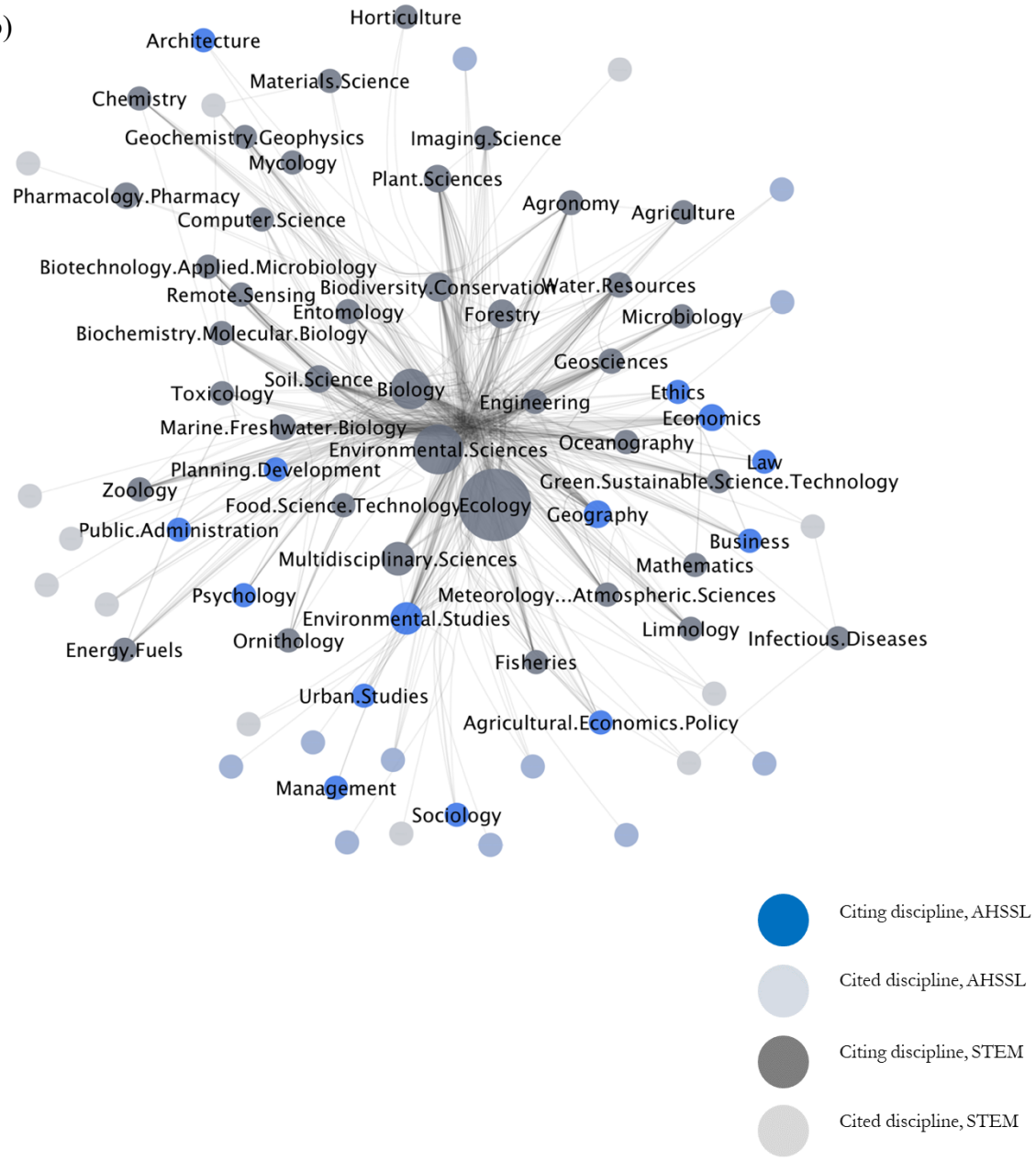
In all three time periods, Ecology and Environmental Sciences had the largest betweenness centrality measures (indicated by node size) in the ecosystem services research citation network (Figure 2.4a, b, c). In the 'early years', a core network of STEM disciplines occupied a central position in the network, with AHSSL disciplines on the periphery. Engineering, Biology and Multidisciplinary Sciences had a moderate betweenness measure (Figure 2.4a). In the period of 'global uptake and rapid growth in disciplines' the network remained divided into STEM and AHSSL disciplines, and Engineering was replaced by Biology in terms of moderate betweenness (Figure 2.4b). Most recently, in the period of 'institutionalisation and rapid growth in publications' there has been a far greater degree of citation mixing between STEM and AHSSL disciplines, with notable AHSSL disciplines Geography, Environmental Studies, Forestry, and Biodiversity Conservation demonstrating moderate level of interdisciplinarity based on betweenness measure (Figure 2.4c). This is further evidenced by more AHSSL disciplines, including Sociology, Anthropology, Urban Studies, and Law occupying a more central network position amongst STEM disciplines (Figure 2.4c). The largest AHSSL nodes in the most recent network were Geography and Environmental Studies. These nodes had the highest betweenness centrality of all AHSSL nodes and were also larger than most STEM nodes (apart from Ecology, Environmental Sciences, and Multidisciplinary Sciences). All other disciplines had smaller betweenness measures, in all time periods, indicating they do not connect disciplines that would otherwise be unconnected.

Through time, the ecosystem services network has grown, to include a larger number of both STEM and AHSSL disciplines, and has become more connected, with a greater density of connections. Disciplines that are more recent additions to the group of publishing disciplines are (inter alia): Political Science, Anthropology, Sociology, International Relations, Ethics, Area Studies. The 'early years' network contained

only 5 AHSSL disciplines and a network clustering coefficient of 0.388 (Figure 2.4a). During the 'global uptake', both of these grew, to include 13 AHSSL disciplines and a network clustering coefficient of 0.627 (Figure 2.4c). The final 'institutionalisation' period involved 23 AHSSL disciplines and a network clustering coefficient of 0.727 (Figure 2.4c).



b)


Horticulture
Architecture
Materials.Science
Chemistry
Geochemistry.Geophysics
Imaging.Science
Mycology
Plant.Sciences
Pharmacology.Pharmacy
Agronomy
Agriculture
Computer.Science
Biotechnology.Applied.Microbiology
Remote.Sensing
Biodiversity.Conservation
Water.Resources
Entomology
Forestry
Microbiology
Biochemistry.Molecular.Biology
Geosciences
Soil.Science
Toxicology
Biology
Engineering
Ethics
Economics
Marine.Freshwater.Biology
Environmental.Sciences
Oceanography
Law
Planning.Development
Green.Sustainable.Science.Technology
Zoology
Food.Science.Technology
Ecology
Geography
Public.Administration
Business
Multidisciplinary.Sciences
Mathematics
Psychology
Meteorology...Atmospheric.Sciences
Environmental.Studies
Limnology
Infectious.Diseases
Energy.Fuels
Ornithology
Fisheries
Urban.Studies
Agricultural.Economics.Policy
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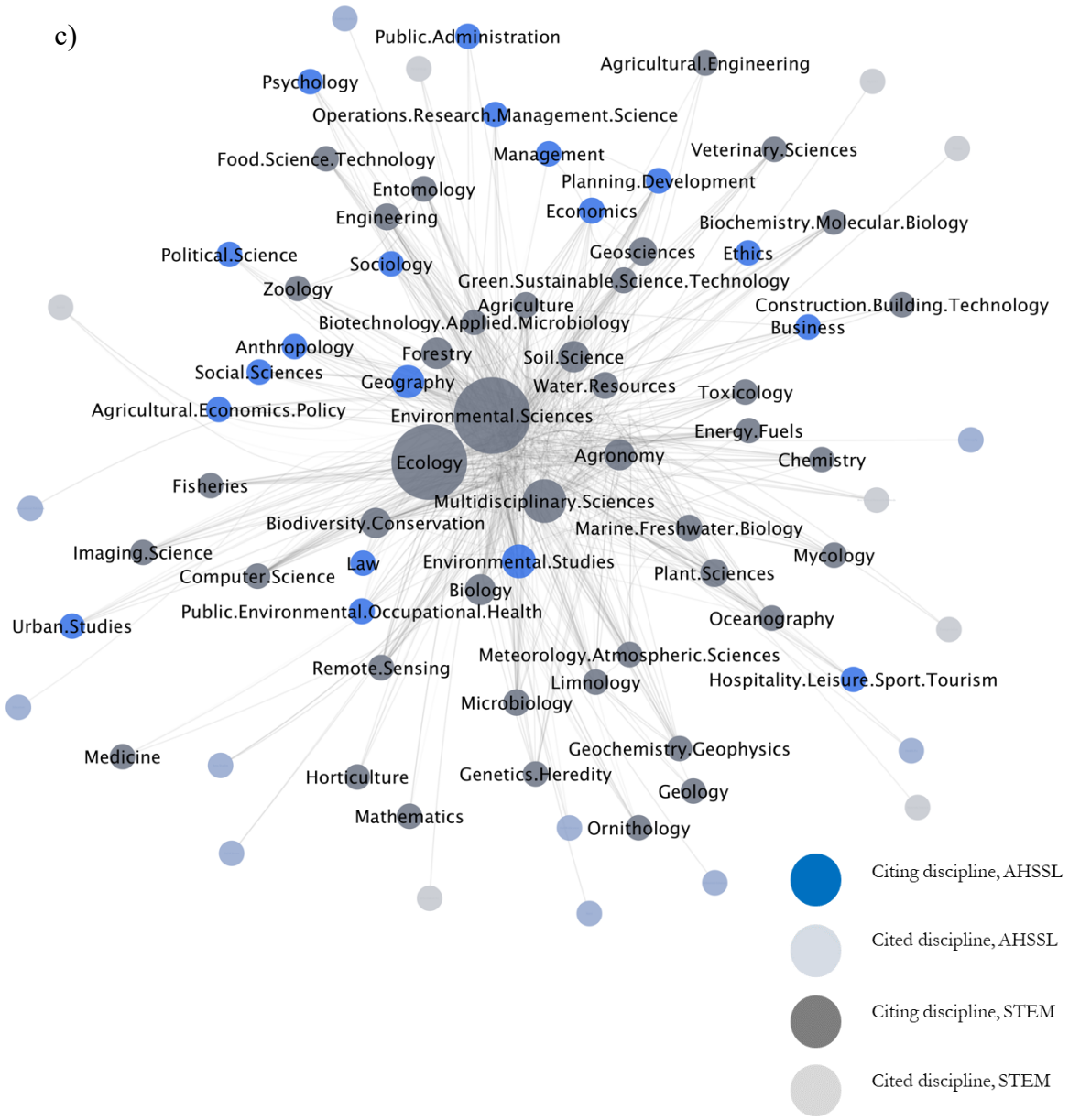


Figure 2.4 citation networks for a) 1983-2000; b) 2001-2010; c) 2011-2019 Node size indicates betweenness centrality, edges indicate citation flows

2.5 Discussion

Previous research has demonstrated a diversity of topics, disciplines, and methods employed in ecosystem services research (Chaudhary et al. 2015; Droste et al. 2018; Martín-López et al. 2019). I add to this body of knowledge an understanding of the extent of interdisciplinary engagement, over three decades, across the field of ecosystem services. I found that ecosystem services research has: 1) been dominated by ecology-orientated disciplines that facilitated disciplinary integration; 2) always been a multidisciplinary field which has grown rapidly over the past three decades; 3) until recently

lacked representation from AHSSL (from here on social science) disciplines. Ecosystem services will likely continue to influence science and policy. However, there is a need for more disciplines that inform our understanding of science and society to shape ecosystem services research (Díaz et al. 2018; Woodhead et al. 2019).

Ecosystem services as a concept has thrived over the past three decades, growing rapidly in terms of articles (Chaudhary et al. 2015; Droste et al. 2018) and disciplines producing research, as well as disciplines cited. Yet, I found a persistent dominance of Ecology-orientated publishing disciplines, reflecting the origins of the concept from the ecological sciences (e.g. Westman 1977, Ehrlich & Mooney 1983). The influence of Ecology was particularly apparent in the 'early years' (Chaudhary et al. 2015; Droste et al. 2018) when over a third of articles were published in Ecology journals. Although the focus of production diversified beyond Ecology in the periods of 'global uptake', and 'institutionalisation' (Chaudhary et al. 2015; Droste et al. 2018), a core of ten mostly Ecology-orientated disciplines, in all three time periods, produced nearly three quarters of all publications on ecosystems services. Similarly, in all three time periods, Ecology and Environmental Sciences played the main interdisciplinary role, connecting otherwise unconnected disciplines.

The high diversity of disciplines cited three decades ago reflects ecosystem services' conception as an multidisciplinary endeavour from the outset (Westman 1977). The original multidisciplinary ideals also meant that the social sciences were represented, albeit in the minority, from the outset. As the number of citing and cited disciplines increased, richness and diversity of article citation patterns remained largely the same, retaining the multidisciplinary character. However, the low proportion of research produced in social science disciplines also remained the same. Although through time, Ecology-orientated disciplines succeeded in broadening the scope of ecosystem services research, incorporating social science perspectives remained challenging, and increasingly so, the more the Ecology-orientated field grew.

Interdisciplinary research is necessary for the development of creative solutions to practical problems, specifically societal and environmental problems (Morillo et al. 2003). However, interdisciplinarity is challenging for practical and philosophical reasons (Campbell 2005). In all three time periods, Ecology and Environmental Sciences contributed to growing the field of ecosystem services, and, through their role as brokers, impacted on a large number of other STEM (from here on natural science) and social science disciplines. Conversely, only two of the ten top producing disciplines were social science disciplines– Geography and Environmental Studies, and up until the latest time period played only a minor role in connecting otherwise unconnected disciplines, suggesting a lesser role for these disciplines. The central role of Ecology and Environmental Sciences suggests that the structures of disciplinary knowledge within journals in these categories are highly influential on the field of ecosystem services.

The rapid growth in ecosystem services research, combined with a consistent core group of disciplines publishing on the topic, within an increasingly dense network, could suggest ecosystem services has become a discipline, or interdisciplinary, in itself. However, if ecosystem services were to be considered a discipline, although diverse, it remains dominated by ecological and environmental sciences, with limited social science influence. If ecosystem services knowledge is to inform practical conservation challenges, research should draw on the wider variety of disciplines required to reconcile conflicts at the intersection of humans and nature, and especially include more social sciences (Mascia et al. 2003). Ecosystem services appear to still have some way to go in terms of providing an avenue to such interdisciplinary solutions. Indeed, many social scientists argue the field reflects narrow disciplinary framings (Gómez-Baggethun et al. 2010; Kosoy & Corbera 2010; Spash & Aslaksen 2015), and is limited to monetary approaches (Nieto-Romero et al. 2014).

Although I found that ecosystem services research draws on and publishes in a diversity of disciplines, and there has been a considerable growth in social sciences disciplines producing ecosystem services research, the relative contribution from the social sciences has remained under 15%. Accordingly, 15% of citations from natural science publications were to the social sciences,

compared to over 50% of citations from social science publications to the natural sciences. Thus, a wider variety of disciplines are engaging with ecosystem services, but the sheer volume of knowledge produced on ecosystem services from the natural sciences overwhelms the considerable gains made in the social sciences.

Yet, within ecosystem services research the social sciences continue to publish and grow, despite being underrepresented in publishing, citations, and existing at the periphery of the network, communicating disproportionately within their own group. Social sciences cite a greater proportion of natural sciences than vice versa, but they still cite more social sciences than would be expected based on the size of its corpus. Authors may turn to familiar citation patterns, rather than draw on the broader field (Costanza & Kubiszewski 2012). A lack of interdisciplinarity at this scale may serve to protect the integrity of social science disciplines and attract broader engagement from within. This could be a necessary strategy to build greater social science engagement (Chaudhary et al. 2015). Indeed, the most recent network shows promise of increased interdisciplinarity facilitated by key social science disciplines. In addition to more publications, a greater number of social science disciplines including Geography, Environmental Studies, and Forestry occupy a more central network position, playing a critical role in connecting otherwise disparate disciplines. As the historical dominance of Ecology (Chaudhary et al. 2015) diminished through time, the two social science disciplines (Geography and Environmental Studies) amongst the ten most productive disciplines increased their share of publications. These two disciplines also gained influence in terms of betweenness centrality, suggesting engagement with interdisciplinary research topics.

My analysis is dependent on a specific journal classification system. Assigning journals to subject categories, as done in the Clarivate classification scheme, is an attempt to capture the differences between disciplines as represented by journals. Published journal articles are a result of a selection procedure that is shaped by submission choices and peer review and therefore reflect structures of disciplinary knowledge as ways of doing, knowing, and writing (Carter 2007; Leydesdorff 2007). A caveat of the approach taken here is that it relies heavily on the classification of journals, and that the

subsequent social/natural science distinction is a result of this too. Therefore, conclusions drawn here are necessarily a result of the Clarivate classification method. However, using the Clarivate classification also offers a new approach to systematically assessing the diversity of the ecosystem services research field, as measured by journal disciplines, and one that can be tracked through time.

Moving towards interdisciplinarity

Within the ecosystem services literature, a need has been identified for a continued move away from describing ecological patterns, towards inclusion of the complexity of underlying social-ecological systems and processes, which would necessitate an interdisciplinary approach (Nicholson et al. 2009). Specifically, consideration of markets, human behaviours and values, as well as processes of decision-making and conflict resolution have been identified as central to successfully balancing human needs and environmental protection (Mascia et al. 2003; Nicholson et al. 2009; Isbell et al. 2017). Specific disciplines that have been argued as capable of providing analytical tools and knowledge on the human dimension are: Political Science, Anthropology, Economics, Psychology, Sociology, Geography and Law (Mascia et al. 2003). Most of these disciplines (with the exception of Geography and to a lesser extent Law) were found at the periphery of my citation networks, indicating room for improvement in incorporating heterogenous knowledge. Such inclusion can help ecosystem services reflect on common critique and grow as a field. Recent contributions towards this goal take human values as the starting point of all efforts into valuing nature (Kenter 2018), and ask what role indigenous knowledge can play in understanding nature's contributions to people (Díaz et al. 2018). Capitalising on the increasing interdisciplinarity of ecosystem services research would allow the representation of different worldviews in conservation challenges, thereby allowing for terms that diverse stakeholders involved in conservation settings can identify with (Kohler et al. 2019).

Continued development towards increased interdisciplinarity can help ecosystem services research return to its own goals: connecting ecological functioning and human well-being. The importance of

nature to people is necessarily subject to diverse worldviews and human-nature relationships (Van Riper & Kyle 2014). Moreover, if environmental governance – complex and multidimensional by nature – is to be informed by ecosystem services, the diversity and plurality of knowledges that is increasingly available in the research should be used. In order to improve applicability in policy and practice, this knowledge base can be used to build shared understandings. Finding common language will help ecosystem services achieve more than support for conservation (Fisher & Brown 2015) by developing new ways of knowing human-nature relations, and thus realise its potential for the inclusion of different perspectives and actors.

Beyond interdisciplinarity in research, the question remains how knowledge is exchanged and finds its way into governance and policy. Further research is needed to explore how ecosystem services knowledge is translated by intermediary actors that push ideas into policy, thereby setting the agenda (Kingdon & Stano 1984). Ecosystem services take place at the site-level, where resource users engage with them. However, the concept is talked about and used in the governing system. More research is warranted to draws on knowledge produced in ecosystem services research. Policy demands (perceived or real) would be expected to influence research, and explicit consideration of the values, worldviews and images of ecosystem services is essential for achieving effective and democratic environmental governance (Jentoft 2017).

Chapter 3. Disentangling ecosystem service preferences and values

3.1 Abstract

Preferences provide information on what people find important in their human-nature relationships, and can therefore inform environmental governance. However, preferences have been argued to be 'reason-blind', obscuring the underlying values that shape them. Increasingly, values receive attention in environmental governance, but they are not always clearly defined. A lack of clarity in values terminology could hamper communication and reduce the ability to successfully align different levels of governance. I disentangle preferences and values to examine whether preferences for ecosystem services provide adequate information on people's values. Seychelles provides an interesting case to study the relationship between policy, preferences, and values, due to recent neoliberal restructuring of the economy and the emergence of the blue economy. I first explore values through a Portrait Values Questionnaire, and then further investigate these values through an ecosystem services lens by asking resource users (fishers and tourism operators) why they find specific services more important than others. I find a disconnect between preferences for ecosystem services and underlying values. A better way to use preferences would be to explore people's reasons for prioritising ecosystem services, thereby improving understanding of underlying values. This could contribute to addressing mismatches and a lack of shared values between formal decision making and resource users; thus, reconciling conflict as well as clarifying impacts on communities. Newly introduced worldviews and values accompanying the blue economy have the potential to clash with the collectivist values found to be important in Seychelles. Potential mismatches need to be discussed explicitly in order to make decision-making more procedurally complete, but also to improve equity and public support. Environmental governance should align not only with short-term preferences, but also with long-term values that determine what people find important in life and how they think things ought to be.

3.2 Introduction

Environmental governance requires an ability to balance, through constructive interaction with different actors and across scales, competing values, interests and preferences (Kooiman & Bavinck 2013). This is particularly important in common pool resource systems, where formal and informal rules often co-exist (Bavinck & Gupta 2014). Effectively addressing societal goals in these systems requires policies and management to align with institution-building and overarching values and principles (Kooiman & Jentoft 2009). Such interactions, involving the state, markets, and civil society, seek agreement on what values are to be attained and how competing interests such as conservation and livelihoods are to be maintained (Bulkeley & Mol 2003).

However, environmental decision-making is often constrained by the practical need to deal with specific and time bound activities (Jentoft & Chuenpagdee 2009). This is particularly true given unprecedented levels of ecosystem and biodiversity declines and their impacts on human well-being (Isbell et al. 2017). Consequently, decisions are often heavily informed by communities' and individuals' environmental preferences – the "specific things individuals want or desire" (Dietz et al. 2005 p. 341). For example, preferences have been used to understand people's attitudes towards ecosystems status (Carvalho-Ribeiro & Lovett 2011) or towards different conservation and climate change mitigation policies (Shoyama et al. 2013). Preferences for ecosystem services have been used widely to inform environmental decision-making, originating in efforts to make explicit the benefits that humans derive from nature and to raise support for environmental protection (Ehrlich & Ehrlich 1981; Millennium Ecosystem Assessment 2005; Mace 2014). In addition, knowing how policy affects the ability of resource users to benefit from ecosystem services can make clear who the winners and losers are in the decision-making process, and differences in people's preferences will inform how trade-offs are understood and accepted. Knowing what is important to resource users can help mediate the inevitable trade-offs that environmental governance entails.

However, preferences themselves are 'reason-blind' (O'Neill 2007 p. 28): whilst they provide information about the intensity of preferring one ecosystem service over another, they do not provide information about the reasons for these preferences. As such, preferences only partially explain why people interact with their ecosystems the way they do: they are not the same as the deeply held values that can explain people's relationships with their environments. Moreover, reported preferences are distinct from underlying, trans-situational and long enduring values that are known to influence preferences and behaviour (Manfredo et al. 2017). In addition, preferences are typically time-specific and reported independent of the wider social practices of use or consumption (Warde 2005). A focus on individual preferences and behaviour has been argued to be ineffective in environmental governance, as it disregards how ways of life exist and are reproduced (Shove 2010). Therefore, in order to align day-to-day management and policy with the institutions and overarching values and principles of governance, the extent to which the underlying values that constitute social practice are expressed in preferences becomes a central question.

A key governance challenge therefore involves linking policy and everyday management to the preferences that people articulate, and the underlying values that shape those choices (Litina et al. 2016). There is a need to disentangle the relationships between values and preferences, which are often used interchangeably, and determine the evidence base necessary to effectively guide decision-making and navigate conflict. I explore whether decision-makers can draw on reported preferences to inform policy and management, or whether there is the need to further evaluate underlying values. To do so I first examine the values of households and specific resource users groups (fishers and tourism operators) in Seychelles. I then explore the extent to which respondents' values are captured in their stated ecosystem service preferences.

Understanding values

Increasingly, the role of values in the relationship between people and ecosystem services is discussed (Raymond et al. 2009; Martín-López et al. 2012; Zafra-Calvo et al. 2020). However, the term values is not always clearly defined, and is often conflated with the relative importance that people assign to

an ecosystem service (Iniesta-Arandia et al. 2014), or with the intensity of preferences (Raymond et al. 2009; Martín-López et al. 2012). Clarifying values terminology could reduce ambiguity in discussion about the role of values in ecosystem services (Jones et al. 2016), and help answer to what extent measures of preferences can also capture values and inform decision making beyond short-term management. In addition, paying attention to values can contribute to aligning governance, policy and management, since mismatches between values and principles at the highest level of governance will likely affect the institutions and day-to-day management on the ground (Kooiman & Bavinck 2013).

Here, I define values as concepts or beliefs about desirable end states or behaviours that transcend specific situations and guide behaviour, which people order by relative importance, so that some values are considered more important than others (Schwartz 1992). Therefore, values are about what people find important in life and how they think things ought to be. The way people prioritise certain values over others results in a systematic cluster of 10 basic values, in which certain values are considered incompatible with each other (Schwartz 1992, 1999; Jones et al. 2016). Values are formed at a young age, and are influenced by both shared culture and unique personal experience (Schwartz 1999).

The 10 basic human values cluster together into four value domains (Figure 3.1) that exist in societies, are formed slowly, and are prioritized in a consistent order across contexts. The self-transcendence and conservatism domains reflect socially motivated values that prioritize universalism and benevolence or conformity, tradition, and security respectively (Schwartz 1992). The self-enhancement and openness to change domains consists of individually motivated values that prioritize power and achievement or stimulation and self-direction respectively, in addition to hedonism (Schwartz 1999). Values are necessarily expressed relative to each other, as it has been shown empirically that it is impossible to, for example, pursue benevolence and power values simultaneously (Borg et al. 2011), hence people prioritise amongst values to form a value structure. Consequently, values can be displayed in multidimensional space, such as through multidimensional scaling (MDS) (Figure 3.1). Values that are orientated opposite each other are considered incompatible; people who

tend to score highly on self-transcendence would score low on self-enhancement and those scoring high on openness to change would score low on conservatism.

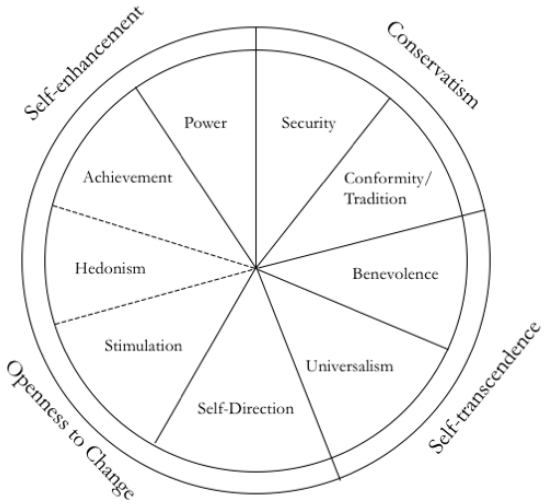


Figure 3.1 Schwartz wheel. Schwartz' theory of basic human values proposes this value structure, where four main value domains (openness to change, conservatism, self-enhancement, self-transcendence) can be divided into more specific values. Figure redrawn from Borg et al. (2011)

Values are the foundation of people's actions and beliefs underlie and shape individual preferences (Manfredo et al. 2017), including for ecosystem services and different policy options. However, it is unclear whether resources users' reported preferences for specific ecosystem services per se also offer adequate insights into these underlying values. Therefore, there is a need to disentangle the relationships between values and preferences.

3.3 Methods

The primary tool facilitating interaction and dialogue among actors and across scales in Seychelles' contemporary marine governance is a Marine Spatial Plan (MSP), a process based on evaluations of ecosystem service use. The stakeholder consultations in the MSP process serve to identify, measure, and map preferences, with the goal of informing policy and management decisions. Thus, the process

assumes that preferences provide an adequate understanding of what people want. Knowledge about the values underlying these preferences will help verify this, and aligning these values with the blue economy context will assist in reaching governance objectives.

Sampling strategy

To examine the relationships between people's values and ecosystem services preferences, I conducted 130 face to face, semi-structured residential interviews with heads of households, in collaboration with researchers from the University of Seychelles. In addition, I conducted 50 face to face, semi-structured interviews with resource users (fishers, n=35 and tourism operators, n=15), in collaboration with the Seychelles Fishing Authority. Interviews elicited respondents' values, ecosystem service preferences, and individual socioeconomic characteristics.

The 130 residential interviews were designed to be representative for each of the districts on Mahé, Praslin and La Digue. Since the districts are all very similar in terms of socio-demographics, I randomly sampled households from 5 of the 22 districts on Mahé (Au Cap, Beau Vallon, Mont Fleuri, Grande Anse, Takamaka), 1 of the 2 districts on Praslin (Grand'Anse Praslin), and covered all of La Digue. This represented 2% of households in each district. In order to minimise research fatigue, I liaised with the University of Seychelles to avoid sampling districts that they had recently surveyed for other projects. The residential survey was completed over 5 weeks in May/June 2018.

The resource user interviews were designed to randomly sample as many small-scale artisanal fishers as possible on Mahé. I followed an exhaustive approach, in which I approached fishers on each of the landing sites in Mahé on multiple days, aiming to cover as much of the population as possible. This included returning to landing sites multiple times, aiming to cover different times and days and see as many fishers as possible. This was repeated for 3 weeks in May/June 2018. I conducted 35 face-to-face interviews with fishers (12 in the north, 14 in the east, and 9 in the south-west part of Mahé), representing 15.6% of the observed average number of artisanal fishing boats (whalers and mini-

Mahé) operating per month across all landing sites on Mahé (numbers obtained from Seychelles Fishing Authority's internal documents).

In addition to fishers, I approached tourism operators on three different locations on Mahé: the Beau Vallon area where the majority of hotels and dive shops are, Eden Island, which is an island on reclaimed land where charter (fishing) boats depart, and Marine Charter, which serves as a meeting spot for tourism workers and also a departure point for tourist trips by boat. I also spoke with two tourism operators on La Digue island. I aimed to speak with a variety of people in different tourism occupations (scuba diving, sailing/boating, fishing charters) and conducted a total of 15 face-to-face interviews.

Semi-structured interviews

The semi-structured interviews had three sections that elicited information on key socio-economic characteristics, values, and ecosystem service preferences (Table 3.1). Only tourism operators and fishers were presented with the section on ecosystem services preferences.

Variable	**Method**	**Measurement**
Values	Portrait Values Questionnaire (Schwartz, 2012)	Score from 1 (not like me at all) – 6 (very much like me)
Ecosystem services preferences	Ranking exercise	Score from 1 (least important) – 10 (most important)
Demographics:		
Age		12 age groups (Seychelles National Bureau of Statistics, 2016)

Education		5 levels of education (Seychelles National Bureau of Statistics, 2016)
Social capital	Extent to which respondent trusts different people	Score from 1 (minimum score, trusts no one) – 29 (maximum score, trusts everyone completely)
Income	Income card with letters for confidentiality	8 income categories (Seychelles National Bureau of Statistics, 2016)

Table 3.1 Sections of the questionnaire with variables and method of measurement. Sample sizes: tourism operators 15, fishers 35, residents 130.

Socioeconomic characteristics

I gathered indicators for four socioeconomic characteristics (social capital, age, education and income) thought to influence people's values (Schwartz 1999, 2006) (Table 3.1). Social capital captures elements of interpersonal trust that allows people to maintain social relations; necessary for maintaining shared values (Van Schaik 2002). Age has been found to have a significantly positive correlation with conservatism and self-transcendence, and education is positively correlated with openness to change and self-transcendence (Schwartz 2012). Income per capita has been found to be positively correlated with self-transcendence and openness to change (Schwartz 2006). The fishers in the sample were slightly older than residents (median age 40-44 vs. 35-39), and residents were older than tourism operators (25-29). Fishers had lower median levels of education (secondary school) compared to residents and tourism operators (post-secondary), and they had higher levels of trust than residents and tourism operators. Fishers and tourism operators had higher median incomes (15-20k Seychellois rupees per month) than residents (10-15k per month).

Values

To elicit values, all respondents were asked a set of standardised statements based on the 21-question Portrait Values Questionnaire (PVQ) (Schwartz 2012). The PVQ aims to cover a comprehensive

range of values, has been recognised across different cultures and validated in 39 languages. The scores on these questions were used to calculate individual respondents' scores across the four value domains (Figure 2a). Each domain is represented by at least four statements (Jowell et al. 2011; Schwartz 2012). The statements describe a person and what is important to that person, and respondents are asked to indicate to what extent the description is like them. They were asked whether statements sounded 'not like me at all', 'not like me', 'a little like me', 'somewhat like me', 'like me', or 'very much like me'. The advantage of Schwartz' method (e.g. over Hofstede's approach (Hofstede 1991)) is that it allows to discriminate between individual people instead of focusing on a group culture, and therefore can study differences between people based on things other than national culture (e.g. socio-demographics (Schwartz 1999, 2012; Jones et al. 2016)).

Ecosystem Service Preferences

I elicited information on ecosystem service preferences from the 50 resource users in the sample. Respondents were shown cards with locally-taken pictures each representing one of 9 ecosystem services, and descriptions were read in English or Creole. The list of services, photos, and descriptions had all been tested for relevance and clarity in a pilot study. Respondents were asked to arrange the cards in descending order of importance, emphasising that we were interested in their personal preferences. Respondents were then asked to explain why the service was important to them.

The ecosystem services included were: fishery, coastal protection, sanitation, habitat, tourism, bequest, education, culture and recreation, access (Table 3.2). The first eight ecosystem services were identified based on a previous Western Indian Ocean regional study that included Seychelles (Hicks et al. 2015) and re-validated during piloting. Following the pilot study, and building on earlier work (Hicks et al. 2014), access was also recognised as an important service, and a picture representing this was included. Although the previous study included materials, I removed this because it was not relevant to resource users in Seychelles: they do not use materials such as sand or shells that are used in other parts of the Western Indian Ocean. Instead, this service provoked confusion, complaints and

attracted protest votes about *others* (not fishers or tourism operators) using marine areas for oil and gas, and land reclamation.

Analysis

Values in Seychelles

Values adhere to a common structure and are thought to be consistent within cultures (Schwartz 1999, 2006). Therefore first, to test the validity of a common value structure in Seychelles, I ran a Multidimensional Scaling (MDS) analysis on individuals scores on each of the four value domains, using the R package *vegan* (Oksanen et al. 2017). Second, to determine values and establish whether they are consistent in Seychelles, I calculated respondents' individual scores for each of the four value domains, and tested for differences in value scores across stakeholder groups. To calculate score, I first averaged the scores on the statements that represent each value domain (self-enhancement, self-transcendence, openness to change and conservatism). These scores ran from 1 ('not like me at all') to 6 ('very much like me'). By averaging the scores for each domain, I arrived at a raw score on each domain for each respondent. I then calculated the average score across all statements for each respondent and subtracted this from the raw scores to correct for individual scale use (some respondents choose more 'extreme' answers than others, and centring scores this way takes this into account). These centred scores were then grouped according to value domain and averaged to calculate the individual scores on the four value domains for each group (residents, tourism operators, fishers) (Jowell et al. 2011; Schwartz 2016). Finally, I tested for differences in scores between respondent groups for each value domain using ANOVA in R.

Since social capital in the form of trust and socio-demographic characteristics such as education, age and income have been found to play a role in individual value formation (Van Schaik 2002; Schwartz 2006, 2012), I wanted to establish whether this also holds in Seychelles. Therefore, I ran a Redundancy Analyses (RDA) to test whether individuals' socio-demographic characteristics explained their value domain scores.

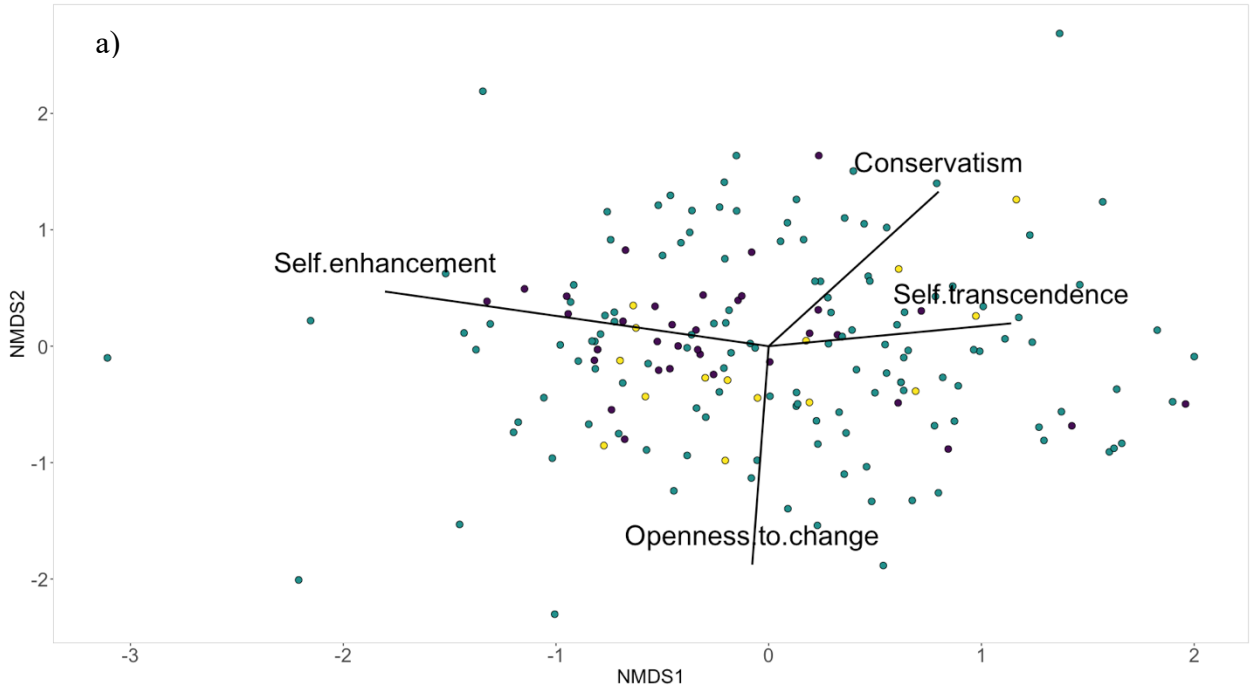
Values through an ecosystem services lens

I coded individuals' qualitative responses to why each ecosystem service was important based on Schwartz (2012) value categories (Table 3.2). Thus, I was able to explore the reasons for preferring certain ecosystem services through a values lens (Hicks et al. 2015). For example, fishers had different reasons for considering fishery service important. Some mentioned self-enhancing reasons, such as the fact that they could earn money from it. Others listed self-transcending reasons, such as being able to feed the population. I asked respondents which was their *main* reason for finding an ecosystem service important for *themselves* and coded these reasons for the value domain that they represented. To capture the link between values and ecosystem services preferences in a different way, I then ran a Redundancy Analyses (RDA) for tourism operators and fishers separately, to test whether individuals' scores on the value domain scores could explain their ecosystem services preferences directly.

3.4 Results

Values in Seychelles

The values questionnaire provided insight into the prioritisation of values that transcend specific situations. Overall, respondents expressed very low (negative) self-enhancement scores compared to other cultures (Jowell et al. 2011). Conservatism scored highly, both relative to the other domains in Seychelles and to values found in other cultures (Jowell et al. 2011) and self-transcendence was high compared to the other domains in Seychelles. Openness to change was neutral (Figure 3.2b). Scores were similar across residents, fishers, and tourism operators (Figure 3.2a, b), with ANOVA p-values of .552 (conservatism), .529 (openness to change), .090 (self-enhancement), and .433 (self-transcendence), suggesting values are consistent across Seychelles culture.


a)
Conservatism
Self.enhancement
Self.transcendence
Openness.to.change
NMDS1
NMDS2

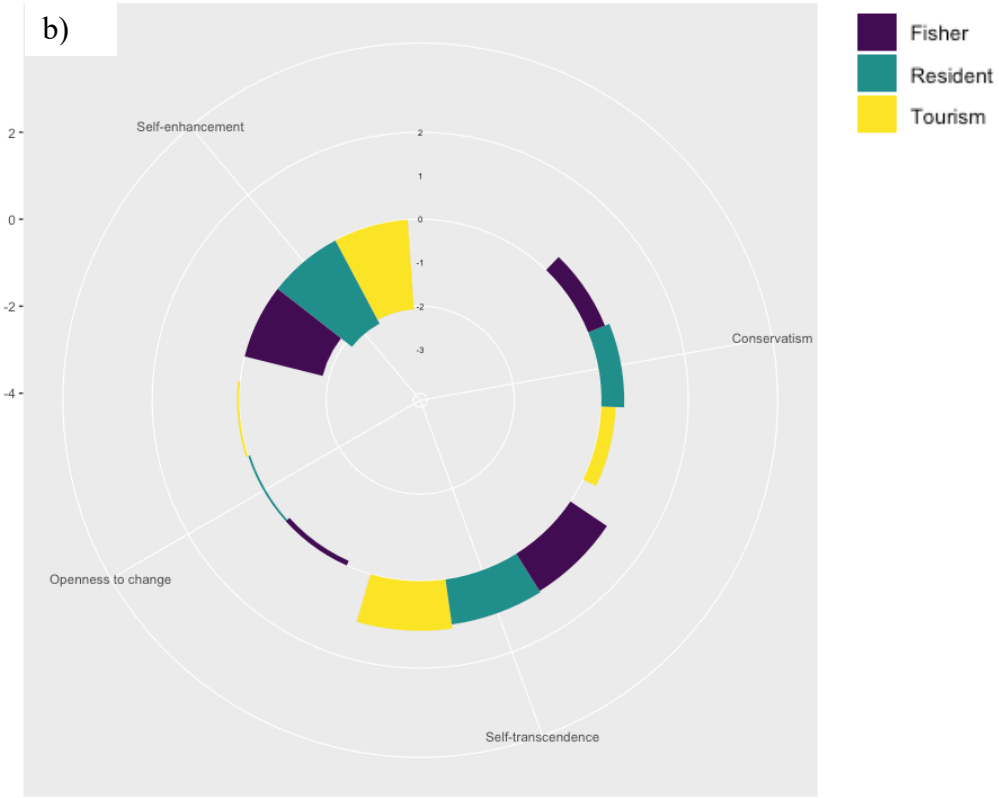

b)
Fisher
Resident
Tourism
Self-enhancement
Conservatism
Openness to change
Self-transcendence

Figure 3.2 a) MDS of Schwartz scores in Seychelles. This MDS plots all respondents (fishers, residents, tourism operators) on the four value domains. The structure of the MDS follows the value structure proposed by Borg et al. (2011) (Figure 3.1), with openness to change and conservatism opposite each other, and self-enhancement and self-transcendence opposite each other. The MDS also shows an even spread of value loadings. b) Circle plot of Schwartz domain scores per group. This shows the relative scores for each of the four value domains. Self-transcendence is high, whereas its opposite self-enhancement is strongly negative. Conservatism is the second highest-scoring value, and openness to change is close to neutral. This figure also illustrates the similarities between the 3 different population groups.

Age, education, income, and trust all were strongly associated with the different value domains (Figure 3.3). Age was positively and strongly associated with conservatism, and negatively with openness to change; older respondents tended to score higher on conservative statements and younger on openness to change (Figure 3.3). Income and trust were positively associated with self-transcendence. Respondents that reported a higher level of income and trust in others tended to score higher on self-transcendent statements. Education was negatively associated with conservatism and positively with self-transcendence and openness to change (Figure 3.3). Individuals with higher levels of education tended to score lower on conservatism statements and higher on self-transcendence and openness to change. The RDA (with value domain scores as response variables, and socio-demographics as explanatory variables) explained a large proportion of the variation and the relationships found were highly significant (at the 1% level).

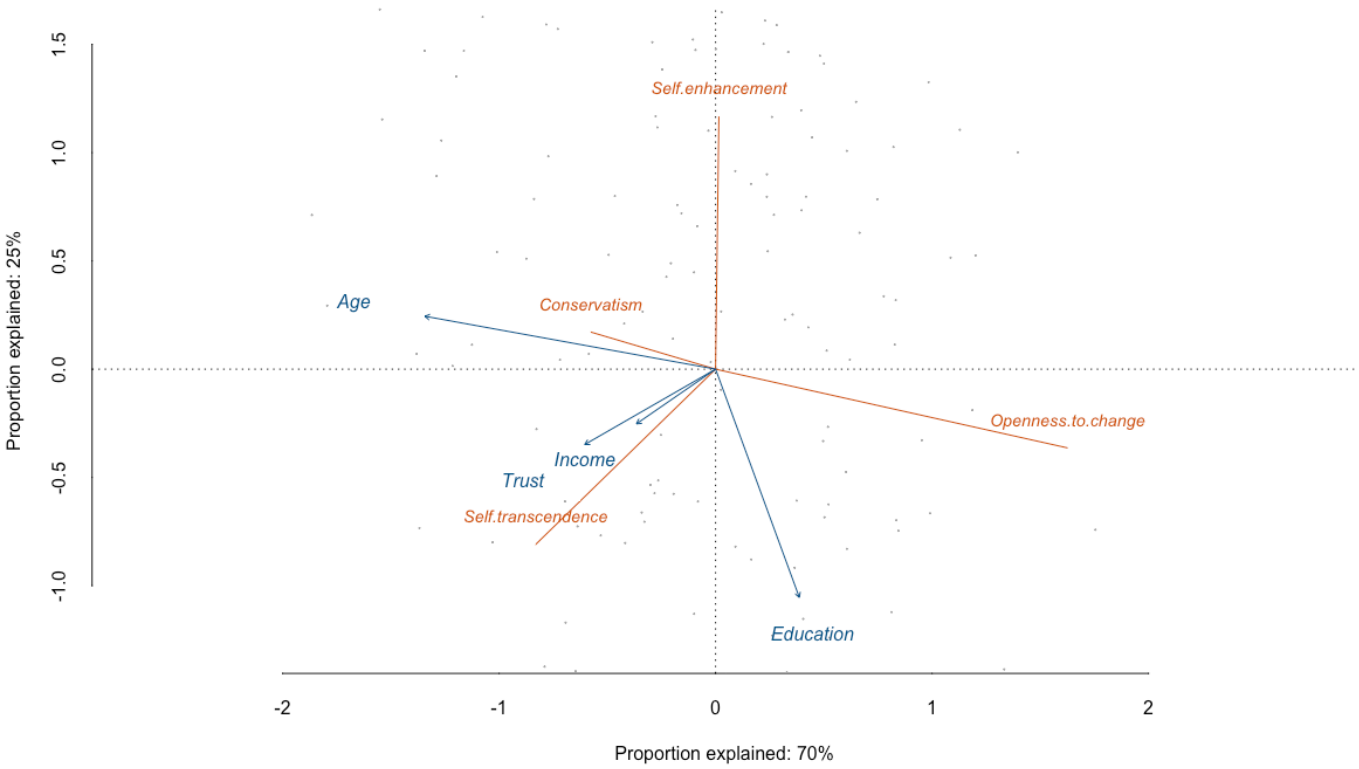


Figure 3.3 RDA of values and socio-demographics, entire population. F value = 0.001 ***. Proportion explained RDA1 = 70% RDA2 = 25%. This RDA shows the link between socio-demographics and score on value domains. Trust and income are positively related to self-transcendence, and age is positively related to conservatism. Education is negatively related to conservatism.

Linking ecosystem services preferences and values

Fishers consistently identified fishery and habitat services as most important, and culture and recreation the least important (Figure 3.4). Respondents gave a range of reasons for why they considered each ecosystem service important (Table 3.2). Self-transcendence reasons were most often given for why respondents considered each ecosystem service important, for example one fisher in the northern part of Mahé said "[tourism] Doesn't benefit me directly, but it does benefit the country - it's the future of the country. Visitors bring in revenue and (…) we can make friends and learn about other countries' cultures too". The second most frequent reason was conservatism, for example one highly experienced fisher said: "Traditional fishers are important". Both self-transcendence and

conservatism are socially motivated values. Self-enhancement and openness to change, both individually motivated values, were the reasons given least often. Self-enhancement reasons for preferring the ecosystem service fishery were expressed by statements such as the following, from another highly experienced fisher: “This is the domain that I am working in. I catch fish to survive”. Openness to change reasons for preferring fishery were expressed by statements like: “Because I am enjoying it, [it is] not just work but a hobby”.

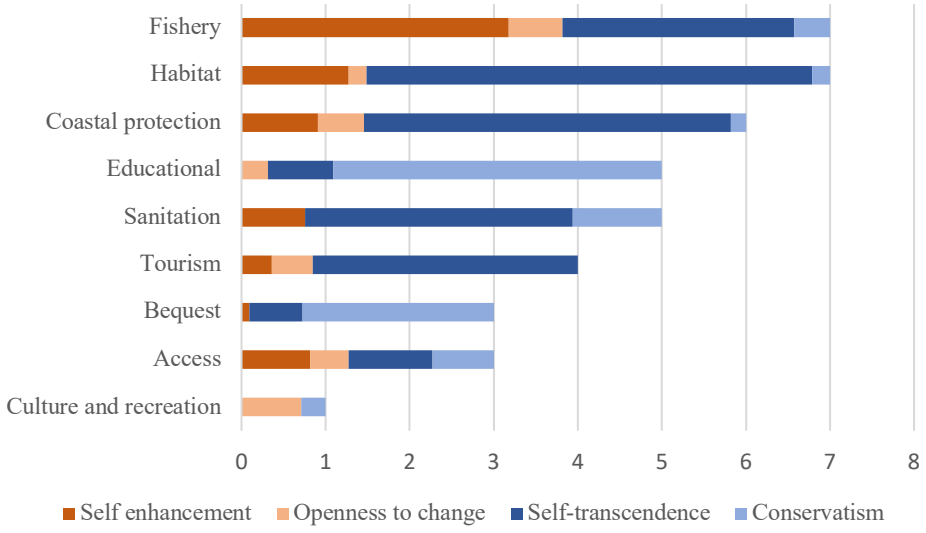


Figure 3.4 Median score of ecosystem services preferences and distribution of coded reasons (assigned values) for these preferences, as indicated by fishers

		Reasons			
Service	Interpretation	Self-enhancement	Openness to change	Self-transcendence	Conservatism
Fishery	Benefits from catching and selling fish	“As a trap fisher, it is important for income and my way of living”	“[It is] a nice activity to do. [It is] fun – I enjoy it”	“The population depends on reef fish to eat”	"Traditional fishers are important"
Habitat	Benefits from having a healthy coral reef	"Healthy reefs mean more fish and revenue"	"Because I enjoy diving and the nice view"	“Reef habitat is where fish live, so we should always protect it”	"Protection for the future"
Coastal protection	Benefits from reef as a barrier against force of waves	"Protection is important so we can have a beach to access our fishing grounds"	"Coast is important to me, [it is] nice to see a pretty landscape"	“Without it, we are not protected. [We need it for] protection of people and other species”	"A healthy coast will inspire people to take care of it"
Sanitation	Benefits from using the ocean for washing and cleaning	"The sea takes away the waste, [which is] good for fishing"		"Before we feed the population, fish need to be clean"	"Important to be hygienic. Keep things clean, love for our environment"
Education	Benefits from gaining knowledge from the marine environment		"You need to learn which fish you can touch"	"Everyone should be the same"	"Important to all of us, our childen and ourselves, you never stop learning"

Tourism	Benefits from visitors and others to enjoy the marine environment	"Sell fish to tourists, get money"	"Tourism brings people together and brings knowledge"	“Tourism is important for the country's jobs – [it] brings employment”	
Bequest	Benefits from knowing reefs will be there for the next generations	"Because through them [youth] we have a chance to control what is going on in the ocean"		"Youth are learning from people who already know about the environment and pass it on to protect the environment"	"Protecting marine life because it is important for future generations to benefit like we are now"
Access	Benefits from being able to access beach and sea without restrictions	"Access facilitates things - like bringing ice from the truck to the boat"	"We need our beaches for leisure"	"Everyone should have access"	"Because it is ours - it is in our culture as an island nation"
Culture and recreation	Benefits from using beach and sea for cultural/recreational activities		"Place for us to socialise. Not everyone gets that in the world, it's nice"		"So that the youth can see how our grandparents did it"

	Reasons				
Service	Interpretation	Self-enhancement	Openness to change	Self-transcendence	Conservatism

Fishery	Benefits from catching and selling fish	“As a trap fisher, it is important for income and my way of living”	“[It is] a nice activity to do. [It is] fun – I enjoy it”	“The population depends on reef fish to eat”	"Traditional fishers are important"
Habitat	Benefits from having a healthy coral reef	"Healthy reefs mean more fish and revenue"	"Because I enjoy diving and the nice view"	“Reef habitat is where fish live, so we should always protect it”	"Protection for the future"
Coastal protection	Benefits from reef as a barrier against force of waves	"Protection is important so we can have a beach to access our fishing grounds"	"Coast is important to me, [it is] nice to see a pretty landscape"	“Without it, we are not protected. [We need it for] protection of people and other species”	"A healthy coast will inspire people to take care of it"
Sanitation	Benefits from using the ocean for washing and cleaning	"The sea takes away the waste, [which is] good for fishing"		"Before we feed the population, fish need to be clean"	"Important to be hygienic. Keep things clean, love for our environment"
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Tourism	Benefits from visitors and others to enjoy the marine environment	"Sell fish to tourists, get money"	"Tourism brings people together and brings knowledge"	“Tourism is important for the country's jobs – [it] brings employment”	

Bequest	Benefits from knowing reefs will be there for the next generations	"Because through them [youth] we have a chance to control what is going on in the ocean"		"Youth are learning from people who already know about the environment and pass it on to protect the environment"	"Protecting marine life because it is important for future generations to benefit like we are now"
Access	Benefits from being able to access beach and sea without restrictions	"Access facilitates things - like bringing ice from the truck to the boat"	"We need our beaches for leisure"	"Everyone should have access"	"Because it is ours - it is in our culture as an island nation"
Culture and recreation	Benefits from using beach and sea for cultural/recreational activities		"Place for us to socialise. Not everyone gets that in the world, it's nice"		"So that the youth can see how our grandparents did it"

Table 3.2 Description of ecosystem services and examples of reasons (assigned values) for fishers' reported ecosystem service preferences (coded into four value domains). Blank spaces indicate no reasons related to that particular domain were given.

The reasons fishers gave for why ecosystem services were important did not always align with their values elicited in the 21-question PVQ (Figure 3.4). For example, although habitat and coastal protection were associated with conservative values (Figure 3.5), they were most often considered important for self-transcendent reasons (Table 3.2).

Self-enhancement values were associated with fishery preferences; conservative values with habitat, access, and coastal protection preferences; openness to change with culture and recreation and tourism preferences, and; openness to change and self-transcendence with sanitation, bequest, and to a lesser extent education preferences (Figure 3.5). I removed the group of tourism operators, because the sample size was very small and the separate RDA that I ran for this group was not significant.

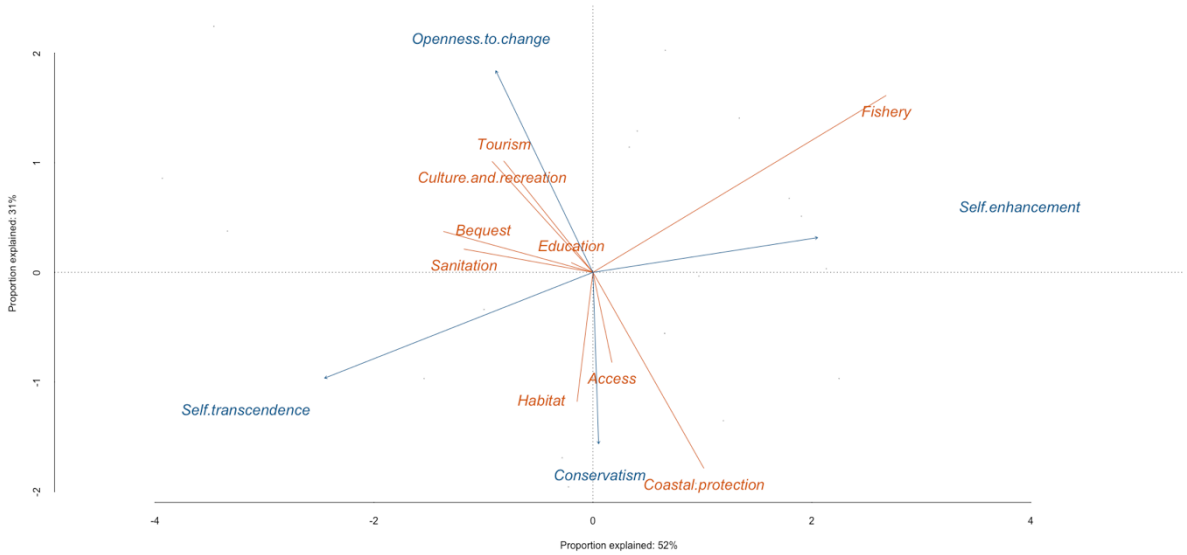

Figure 3.5 RDA of values and ecosystem services (fishers). F value = 0.047*. Proportion explained RDA1 = 49%, RDA2 = 29%. This RDA shows the link between the value domains and the way in which fishers ranked ecosystem services. A higher preference for fishery is linked with self-enhancement, culture and recreation and tourism with openness to change. Access, habitat and coastal protection are closely linked with conservatism.

Similarly, conservatism values were associated with habitat and coastal protection preferences (Figure 5), but conservatism was only mentioned once by a resource user as a reason for why these services were important and specifically, for 'future generations' (Figure 3.4, Table 3.2). Instead, resource users most frequently gave self-transcendence reasons for why habitat and coastal protection were important. Similarly, tourism preferences were associated with openness to change values (Figure 3.5), but self-transcendence was the main reason that fishers gave for why tourism was important.

Fishery was closely associated with self-enhancement values (Figure 3.5), which was a reason given by some respondents for why fishery was important, for example as 'income and food for themselves and their families'. However, other fishers identified conflicting self-transcendence reasons including 'feeding the population' or openness to change reasons, such as 'they enjoyed fishing', that it was 'not just work but also a hobby', which fit in the stimulation/self-direction/hedonism part of the values wheel (Figure 3.1). The greatest differences were found for Education, which although associated with openness to change values, were most often considered important for conflicting conservatism reasons.

3.5 Discussion

I set out to establish whether reported preferences provide enough information on peoples' values to inform effective policy. I found Seychelles to be characterized by low self-enhancement values and high self-transcendence values (Schwartz 1992); scores that were consistent internally and across population groups. However, respondents' values did not reflect their ecosystem service preferences, suggesting a disconnect between ecosystem service preferences and underlying values. The most highly ranked service - fishery - was most closely associated with the least important value - self-enhancement. Instead, respondents' ecosystem service preferences were motivated by a variety of reasons reflecting different, sometimes conflicting value domains. Self-transcendence values, the most important value domain in Seychelles, were most commonly reflected in the reasons people gave for different ecosystem service preferences; further evidence that preferences do not adequately

capture human values. A focus on preferences in environmental governance risks over-emphasising specific values (e.g. self-enhancement), that may not be culturally representative.

Values in Seychelles

Seychelles was characterized by strong self-transcendent values, consistent both internally and among user groups. The internal consistency in value scores indicates Schwartz's (1992) human values theory holds in Seychelles, providing valuable insights into the cultural values of the country. Values are known to be culturally driven, and although cultures within countries are rarely fully homogeneous, people's values tend to be more similar within a country (especially in a country that is small and relatively isolated, like Seychelles) (Schwartz 2006). Thus, the consistency among user groups indicates, despite distinct stakeholder interests, in Seychelles, residents, tourism operators, and fishers are culturally similar, hold similar values, and prioritise collectivist values such as benevolence and equality over individualist values such as achievement and power.

Small differences that did exist among individuals in value scores, were associated with key anticipated socio-demographic differences including trust, age, and education. People who tended to trust others more fully, assigned greater importance to socially orientated self-transcendent values. Trust plays a role in maintaining social relationships, which enable shared values to prevail (Van Schaik 2002). In Seychelles, older respondents, and those who had completed fewer years in education tended to assign higher scores to conservatism values, such as security and values associated with maintaining the status quo, both relationships that have been shown before (Schwartz 1992; Schwartz et al. 2012).

Link between values and preferences

Specific values were found to be associated with specific ecosystem services. Fishery was related to the self-enhancement value domain, mirroring earlier research that found success, achievement and economic benefit to be associated with fishery benefits (Pollnac et al. 2012; Hicks et al. 2015). However, the relative importance of the value domains did not align with the relative importance of

ecosystem service preference. Although fishery was the most highly ranked ecosystem service, the self-enhancement domain was generally found to be unimportant in Seychelles. In addition, the association that I found between self-enhancement and fishery service preferences, although confirming earlier findings (Pollnac et al. 2012; Hicks et al. 2015), does not resonate with the full range of reasons that fishers gave when explaining why fishery was important to them. Only 45% of respondents included self-enhancement reasons, with other important reasons classified as self-transcendent. For the other services too, the reasons for ranking services in a particular way often departed from associated underlying value domains. Thus, people explained their ecosystem service preferences through values that were different from, and sometimes in direct conflict with, the underlying values identified in the RDA.

Although preferences provide information on the ranking of one ecosystem service relative to another, they do not adequately explain *why* this choice is made. People gave a variety of reasons for why they preferred specific ecosystem services. However, I found that the values underlying preferences differed across individuals, and within ecosystem services. The diversity in motivations made it difficult to meaningfully combine reasons to capture one motivating value for each ecosystem service preference, particularly because values from opposing value domains are in direct conflict with each other (e.g. self-enhancement and self-transcendence). Evidently, preferences alone do not contribute to informed decision-making, which instead requires judgement, deliberation, and expressive rationality (O'Neill 2007). Decision-making based on preferences alone is therefore procedurally incomplete and also potentially ineffective, because it does not consider the full range of reasons that people have for interacting with the environment the way they do.

Values, preferences, and governance

The most commonly given reasons for preferences (self-transcendence and conservatism) were more reflective of broader human values, and more aligned with the general values structure in Seychelles, than the direct association between value domains and ecosystem services preferences. Therefore, expanding the understanding of preferences for ecosystem services to include values as the reasons

for preferring certain ecosystem services over others is vital for the alignment of different levels of governance. A better way to use preferences would be to explore people's reasons for prioritising a range of ecosystem services, as this facilitates a broader discussion on why people have certain preferences beyond just the maximisation of utility (Etzioni 1986).

Management and day-to-day decision making are concerned with reconciling preferences within short time frames, and may be made more complete by including an understanding of the values behind these preferences. There is a difference between preference satisfaction on a one-dimensional scale (utility) at the time of use or consumption, and the reality of resource users that consists of multiple values and social practices (Warde 2005; Strengers & Maller 2014). Therefore, an effort is needed to translate the wider context of governance, wherein values, world views, principles, and images are negotiated, into institutions and the trade-offs felt by resource users (Kooiman & Bavinck 2013).

Indeed, mismatches and a lack of shared values between those that are steering governance and resource users have been found to lead to contestation of management decisions and actions, as well as disproportionate impacts on poor and marginalised communities (Sowman 2015). If the goal of environmental governance is to reconcile different interests to reduce conflict, a focus on preferences does not offer adequate information on shared underlying values that might contribute to reaching that goal. In order to achieve effective institutions and management, values need to be articulated and discussed explicitly in the governance process (Song et al. 2013). Since values are relatively stable within cultures and across generations and cannot be changed at will, knowing them and aligning them with policy and management is vital, rather than trying to change values in order to achieve a certain outcome (Manfredo et al. 2017).

Values promoted in emerging forms of environmental governance

Contemporary environmental governance, inspired by ecological modernisation thinking, increasingly proposes embedding environmental interests into the economy, often proposing that this will lead to win-win situations through more efficient institutions (Jänicke 2009). The blue economy is an

example of one such governance approach, which envisions moving towards markets and economic growth as a basis for overcoming environmental degradation and scarcity. In the Seychelles context, the blue economy is operationalised through a Marine Spatial Plan (MSP) in which stakeholder consultations serve to capture preferences from resource users (Seychelles Government et al. 2017). Although MSP has the potential to democratise ocean management by engaging with a variety of stakeholders and their values, it is increasingly implemented in a post-political sense (Flannery et al. 2018). Post-political MSP has been argued to characterise the decision-making process as a process of "rational consensus, rather than antagonism and power relations" (Tafon 2017 p. 259), blocking deliberation with techno-managerial approaches and favouring values and worldviews of the powerful elite (Flannery et al. 2018). MSP, in this form, as the practical implementation of blue economy policy is arguably a reflection of the values and worldviews that the concept promotes. Aiming for the optimisation of ocean uses and attempts to place diverse human-nature relationships on a single scale by measuring preferences alone privileges an approach in which the economic dimension is overemphasised, because it is the dimension which lends itself most for commensurability.

However, a focus on utility alone excludes explicit discussions about winners and losers; by placing every possible use (and simultaneously excluding non-use values) on a single scale, they are made to be compatible with market logic, closing the door to deliberations and considerations of equity (Flannery et al. 2016). When ecosystem service benefits disregard underlying values and are measured along a single scale, it promotes a utility-focused vision on human-nature relationships (Jones et al. 2016). Utility has been described as a tautology: by assuming that people's choices reflect their preferences because they strive to maximise utility, there is still no explanation for these preferences *per se* (Etzioni 1986). I have shown that it cannot be assumed that preferences are directly related to values. It is therefore not sufficient to focus on increases or decreases in utility to guide trade-offs, as this suggests that compensation is possible: if one person is made worse off by a management decision, e.g. on limiting fishing efforts in one place, they can be compensated for their losses by those who gain from the measures, e.g. tourism operators. However, this compensation is often hypothetical and also often unacceptable (Tetlock et al. 2000; O'Neill 2007; Daw et al. 2015),

and therefore unlikely to contribute to effective environmental governance. Taking into account the wider values context avoids the illusion of substitutability and compensation that comes with a focus on preferences alone and allows for the deliberation on incommensurable values. This not only makes the decision-making process procedurally more complete, but it also allows for recognition that there is no compensation for the loss of certain values (Daly 1995). If deeply held values are pitted against each other, there is no compensation that can remedy this.

Disentangling the values that are underlying ecosystem services can improve decision-making, not only to make procedural improvements, but also to make outcomes more equitable and increase public support. In the Seychelles context, difficult trade-offs could be solved by finding commonalities in the widely shared values that people have (Moon et al. 2019). Finding shared values can help go beyond the incommensurable values that play a role in individual and specific situations (e.g. fishery is assigned both self-enhancing and self-transcending values). By appealing to the shared self-transcendence values, a more deliberative approach can help make "an intelligible choice between feasible options, where there is no appropriate value in terms of which the options might be compared as 'better', 'worse' or approximately equal" (Holland 2002 p. 23).

However, the predominantly collectivist values (self-transcendence and conservatism) that I found in Seychelles are at odds with the more individualist values that are part of the blue economy narrative, and that are given prominence in the MSP process. A lack of explicit discussion about values can lead to misaligned governance, particularly where formal decision-makers and resource users disagree, such as about the use of property rights for effective marine governance (Sowman 2015). The values and worldviews behind the blue economy define the governance landscape in Seychelles, and how this is translated into day-to-day management. There is a need to discuss more explicitly the potential mismatches between these underlying values in resource users and the governance system, as they are likely to transcend into other levels of governance too, thereby reducing the likelihood of effectively addressing issues and goals (Kooiman & Bavinck 2013).

Here, I have pointed at the complex relationships between preferences and values, and the way that measuring preferences can obscure relationships between values and social practices. The daily use of ecosystem services by resource users does not happen in a vacuum but is a moment in social practice, which resists individualistic framings. At the same time, being part of social practices also implies that behaviour and social roles are not predetermined (Shove 2010). Rather, viewing the use of ecosystem services as social practice provides opportunities to learn and identify intervention points that are different from providing individual incentives or rules. Management interventions should be mindful of the context of values in which they operate, not only to increase the likelihood of success, but also to ensure rational procedures. When values are discussed explicitly, this can increase the likelihood of successfully reconciling competing goals and navigating conflict in environmental governance. Taking values into account can inform governance that aligns not only with what people want on any given day, but also with what they, and their communities, care about in the long-term.

Chapter 4. Perspectives on the blue economy in Seychelles

4.1 Abstract

The blue economy has gained traction as a key concept that seeks to stem biodiversity loss whilst stimulating economic development, thereby integrating environmental and economic interests. Although the blue economy builds on the more familiar green economy, academic critique is still emerging and can be slow to translate into changes in policy and practice. What the blue economy means to national and local policy-makers and practitioners is seldom explored, and specificity is lacking on how the triple bottom line of economic growth, environmental sustainability, and social equity can be attained. This article explores these issues in one of the pioneering nations promoting the blue economy – the Republic of Seychelles – to establish a) how policy makers and practitioners in Seychelles perceive the blue economy b) what perspectives influence the concept; c) who stands to gain or lose from its implementation. Seychelles has a unique position in Africa, due to its remote location in the Indian Ocean, its political history, and its pioneering role in promoting the blue economy: it presents itself as a leader for Africa in this respect. Using a combination of interviews and Q-methodology, I identify three perspectives on the blue economy in the country. Policymakers and practitioners are either: *supportive* in principle, *critical* in practice; *pragmatic and accepting*; or *idealistic*. These three perspectives capture the interpretations of those tasked with enacting the blue economy, but many of the perspectives present in international discourse are not present in the country, and indeed elements of them are met with resistance. Drawing on a social network analysis I find that the *critical* perspective is most influential in terms of information, both with government and non-government actors. However, the *pragmatic and accepting* perspective is more influential in terms of resource allocation, indicating a lack of resources could hamper actions by the actors that would like to see change.

4.2 Introduction

Marine ecosystems are some of the most vulnerable ecosystems on the planet, and are increasingly threatened by anthropogenic pressures, leading to concern over a decline in marine biodiversity (Hughes et al. 2017). However, areas of greatest biodiversity also tend to be where people are most dependent on their natural environment but where the capacities to sustainably manage these resources are lowest (Barlow et al. 2018). In an effort to conserve this rich biodiversity, whilst simultaneously supporting people's wellbeing, interest has grown in the 'untapped' economic opportunities that oceans offer and their potential to address these goals (OECD 2016; The Economist Group 2018).

The blue economy has emerged as a key concept in this area and seeks to stem biodiversity loss whilst stimulating economic development, thereby integrating both environmental and economic interests. Building on the green economy concept, the blue economy was popularised during the Rio+20 summit in 2012 (Campbell et al. 2013; Silver et al. 2015). Since then, the concept has received attention from sovereign nations, NGOs, and researchers. Articles have tracked the development of the concept and its meanings (Silver et al. 2015; Winder & Le Heron 2017; Voyer et al. 2018), and the blue economy, particularly in Africa, is becoming a prominent influence in environmental governance (e.g. African Union Commission 2014). The blue economy originated as a way of connecting oceans to the green economy – the theme of the Rio+20 conference (Silver et al. 2015) which was popularised in environmental governance as a way of expressing and incorporating the economic importance of the environment to decision making (Pearce et al. 1989). To many, the blue economy is the new green economy, with a similar emphasis on the benefits of nature for the economy (United Nations 2014). And like the green economy, funding bodies such as the World Bank, the EU, and the UN/UNDP all now mention the blue economy in their strategy documents (e.g. UNEP et al. 2012; The World Bank 2017).

Although the blue economy builds on the green economy, academic critique can be slow to translate

into changes in policy and practice, and as a result familar critiques are emerging in relation to the blue economy (Barbesgaard 2017). Indeed, Barbesgaard (2017) argues that the flaws of the green economy have not been addressed in the blue economy, where the same practices of privatisation and capture of natural resources are happening in the oceans, just as they happened on land. This has led to 'ocean grabbing' (thereby negatively affecting human and/or environmental well-being (Bennett et al. 2015)) under the guise of conservation. Fundamental issues associated with neoliberal environmental management persist in the blue economy, such as a lack of situated historicity, and by only working with established powerful actors, existing power inequities are enhanced or entrenched (Dempsey 2016; Dempsey & Suarez 2016). Moreover, there seems to be little agreement on what the blue economy actually *is* and how the promoted triple bottom line of economic growth, environmental sustainability, and social equity can be attained.

While there are various perspectives on and definitions of the blue economy, insights into how critiques are regarded by policy makers and practitioners have been absent. Furthermore, if the multiple, competing priorities are not acknowledged, conflict is rendered more likely (Silver et al. 2015; Voyer et al. 2018), and it is made more difficult to engage with critique. This is further exacerbated by the fact that blue economy perspectives in practice (especially at a national level where implementation occurs) are seldom analysed. Whilst there is an emerging body of work taking a critical stance towards the blue economy (Childs & Hicks 2019), what it means for the positioning of the state and for different conceptualisations of the ocean (Choi 2017; Steinberg & Kristoffersen 2018), there is a lack of understanding on the extent to which these critiques are incorporated into policy and practice. Thus, what is lacking is a critical reflection, drawing on political ecology, of what the blue economy means in practice, and an understanding of who is driving this agenda at a sub-national scale.

To address this I first revisit current understandings of how the blue economy has been articulated at an international, national and sub-national scale. I then use a mixed methods approach integrating

social network analysis, Q-methodology, and qualitative interviews, in one of the pioneering nations promoting the blue economy – the Republic of Seychelles – to establish a) how policy makers and practitioners in Seychelles perceive the blue economy; b) who and what perspectives are influencing the blue economy in practice; c) who stands to gain or lose out.

Perspectives on the blue economy

Different perspectives on the blue economy have emerged during international conferences, within national and international policy documents, and other grey literature. The triple bottom-line goal of economic growth, environmental sustainability, and social equity is mentioned in most definitions of the blue economy (e.g. United Nations 2014; Abu Dhabi Declaration 2016; The Economist Group 2018). However, within them, five distinct perspectives emerge that variously emphasize 'Economic', 'Environmental', or 'Social' priorities. **Firstly**, the Abu Dhabi Declaration (2016) emphasises the economic opportunities that oceans have to offer, a perspective that views "Oceans as good business" (Silver et al. 2015; Voyer et al. 2018). This perspective tends to be shared by high-income countries and their representative organisations, such as the OECD, and is particularly focused on the growth potential of oceans, exemplifying the 'oceans as the new (economic) frontier' narrative (OECD 2016; Steinberg 2018). **Secondly,** and closely related is the "Oceans as drivers of innovation" perspective (Voyer et al. 2018). This perspective is expressed by various institutions and businesses in policy documents and grey literature that emphasise the role technology can play in the blue economy (European Union 2015; The Economist Group 2018).

The **third** perspective, mostly used by environmental NGOs, emphasises environmental opportunties, highlights the importance of natural capital and ecosystem services and, in doing so, views "Oceans as natural capital". Within this perspective, nature was never intended to be commodified or financialised. Rather, it sees the blue economy as a way to let biodiversity become a part of the equation, and thus to create an enterprising nature (Dempsey 2016). This enterprising nature is reflected in definitions of the blue economy that focus on recognising marine ecosystems as natural

capital, with protection of these ecosystems assumed to follow automatically (WWF 2015). However, in practice, protection has often not followed automatically. Rather, 'nature' has had to be actively turned into natural capital, made investable, and comparable to other economic investments (Dempsey & Suarez 2016; Ouma et al. 2018). This transformation has been criticised for its unintended consequences. This is both in ontological terms by turning nature into something instrumental that can be managed in order to maximise human well-being (McAfee 1999; O'Neill 2007), as well as epistemologically by bringing nature into alignment with the vision of natural capital, thereby becoming prescriptive of what nature should be and how it can be known (Macdonald and Corson 2012). These two critiques identify an inherent contradiction in the natural capital approach, and how in its application to an "Oceans as natural capital" narrative may diverge from its original meaning.

The last two perspectives on the blue economy emphasise societal opportunties and view "Oceans as (small-scale fisheries) livelihoods" and "Oceans as integral to (Pacific) Small Island Developing States". These perspectives both stress the importance of oceans for local economies and livelihoods, thereby being quite similar. The **fourth**, "Oceans as integral to SIDS" draws attention to the unique vulnerabilities that small islands experience, a result of their geographic positioning, whereas the **fifth**, "Oceans as livelihoods" is concerned with all coastal communities. Additionally, while both these perspectives stress the importance of oceans for local economies and people, the "Oceans as integral to SIDS" lens is not found to "necessarily exclude large conservation enclosures or extractive activities like industrial fishing or mining" (Silver et al. 2015 p. 150). The combined perspective of "Oceans as livelihoods" is expressed by the UN, saying that "an oceans economy approach supports sustainable livelihoods and food security for SIDS and coastal populations." (United Nations 2014 p. 2).

In addition to research on different perspectives on the blue economy in international discourse, other work, such as in China (Choi 2017) and in Norway (Steinberg & Kristoffersen 2018), has contributed to understanding local articulations of the blue economy in practice. This work has emphasised the

role of the state in positioning and sustaining itself as a key actor, whilst attempting to de-politicise and bring into the managerial realm decisions about ocean governance. This is done by attending to a perceived need for a better-managed ocean, which positions oceans as currently chaotic and full of competing uses. This, according to Choi (2017), leads to the subtle governmentality that embodies 'ocean grabbing' by changing people's relationships with and perspectives of the ocean in the name of sustainable development. However, as Steinberg and Kristoffersen (2018) point out, the existence of several (sometimes competing) discourses means that there is room for negotiation, and that ocean grabbing is not the inevitable outcome. Here, I draw on earlier critiques to empirically explore how competing discourses play out in practice in one of the pioneering nations promoting the blue economy – the Republic of Seychelles. Aiming to complement previous critical work, I assess how "the ether of the blue economy touches [the] ground" (Choi 2017 p. 40), through exploring how local practitioners experience and participate in the drive towards a manageable 'ocean sector', how the materialisation of the blue economy is conceptualised and felt, and how local actors provide resistance/offer counter-narratives.

Policy context

The Government of Seychelles emphasises the importance of oceans for local economies and livelihoods, as in the "Oceans as livelihoods" and "Oceans as integral to SIDS" perspectives on the blue economy (Michel 2015). Despite having graduated from a developing state into a high-income country, Seychelles remains vulnerable. It is geographically isolated, at risk from sea level rise and coastal inundation, and has an economy that relies heavily on two sectors, fishing and tourism, which are vulnerable to external shocks (Amla 2015). Furthermore, being classified as a high-income country now, Seychelles is no longer eligible for many aid projects. The combination of these factors might help explain why Seychelles has embraced the blue economy so vigorously, presenting itself as a pioneer not only to other island states, but also to international donors that are committed to environmental and climate change concerns. Indeed it has been argued that "the [debt] Swap is a

product of, and inseparable from, a much longer geopolitical and political-economic history of SIDS, economic globalisation, debt and 'sustainable development'" (Silver & Campbell 2018 p. 2)

4.3. Methods

I developed a mixed methods approach that integrates qualitative interviews, Q-methodology, and social network analysis, to investigate blue economy-influenced environmental policy making in Seychelles. This is to:

a) establish how policy makers and practitioners in Seychelles perceive the blue economy;

b) determine who and what perspectives are influencing the blue economy in practice;

c) evaluate who stands to gain or lose out.

Data collection took place between March 2017 and March 2018 and involved four stages:

1) initial face-to-face open-ended interviews;

2) structured online Q-method surveys;

3) structured online social network survey, and

4) follow-up face-to-face open-ended interviews.

Actors in Seychelles blue economy

I was interested in exploring the perspectives of environmental policy makers and practitioners involved in the enactment of the blue economy in Seychelles. The Marine Spatial Plan has been the centrepiece of the blue economy in Seychelles (Seychelles Government et al. 2017). Forty organisations were identified by the Seychelles Government as relevant to the blue economy and included in Seychelles MSP process. I managed to obtain contact details for 29 of these organisations and approached these for interview and asked them to complete my surveys. I added additional interviews and surveys as new organisations were mentioned in the initial interviews (Table 4.1).

Respondents were considered representatives of their organisations, and thus key actors in the Seychelles blue economy. I conducted 18 initial interviews (45% of the organisations from in the MSP) across the four main sectors (Fisheries, Conservation, Economic Development, and blue economy) involved in the blue economy. The social network survey was completed by 18 organisations, the Q-method by 12, and follow up interviews conducted with 11 (Table 4.1).

Perspectives on the blue economy in Seychelles

I followed a Q methodology to establish how policy makers and practitioners in Seychelles perceive the blue economy. Q methodology combines quantitative and qualitative techniques to understand values and perspectives of various actors (McKeown & Thomas 1988; Watts & Stenner 2005; Zabala et al. 2018). Q methodology does not aim for a representative sample, as it is not concerned with the prevalence of opinions in populations (Zabala et al. 2018), as opposed to "R methodology", and therefore large and random samples are not required (McKeown & Thomas 1988).

The Q-methodology approach I followed was based on Zabala et al. (2018) and involved three broad steps. **First** I used a snowballing sampling approach to identify actors involved in, and documents relevant to, the blue economy policy and practice in Seychelles to extract a set of statements that reflect the entire spectrum of opinions about the blue economy. I conducted 18 initial face-to-face interviews with actors involved in the blue economy in Seychelles, in which I explored the work their organisations were involved in, if respondents mentioned the blue economy, they were asked to elaborate on the opportunities and challenges it raised for them. All respondents mentioned the blue economy. These interviews were combined with data extracted from official government documents on the blue economy, such as 'the Blue Economy Roadmap' and archives of the speeches from the former and current president of Seychelles that were classified under 'blue economy' in the Seychelles State House online archives. I used the interviews and document analysis (so-called naturalistic samples) (McKeown & Thomas 1988) to extract statements reflecting the range of perspectives on the blue economy present in Seychelles. The statements were inductively coded under five emergent

themes: Conservation, Culture and Identity, Economy, Equity, and Rhetoric. The coded statements were then organised into a comprehensive list of statements (concourse) that reflects the entire spectrum of opinions about the blue economy, as expressed by the respondents and in official documents (Zabala et al. 2018). I reduced the concourse to 32, by removing repetitive statements, the 32 statements reflected opinions on: Conservation (6 statements), Culture and Identity (5), Economy (10), Equity (8), and Rhetoric (3). Choosing 32 representative statements allowed for a symmetrical Q-sort for respondents to complete (Zabala et al. 2018).

Second, all initial interviews, and an additional 11 individuals representing organisations in the BE, were asked, via an anonymised online survey, to rank the 32 selected statements following a Q methodology whereby respondents organise statements into categories of 'agree', 'neutral', and 'disagree'. The 12 respondents span the broad range of sectors involved in the blue economy (Fisheries, Conservation, Economic Development, blue economy-specific), although there was only one respondent from both fisheries and tourism/economic development. In the first part of the Q-survey, respondents were free to allocate as many statements to each category as they desired. In the second part of the ranking exercise, respondents had to follow the forced distribution that is characteristic for Q methodology (McKeown & Thomas 1988; Zabala et al. 2018). This forced distribution (shown in Figure 4.1) made sure that respondents rank statements relative to each other, as well as forcing respondents to make difficult decisions.

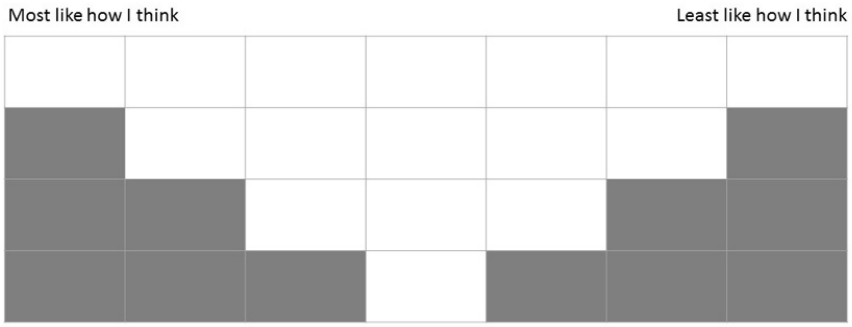

Figure 4.1 Q-methodology ranking grid

Analysis

To specify a discrete set of perspectives held by policy makers and practitioners on the blue economy in Seychelles, I analysed responses to the Q exercise using a principal component analysis with a varimax rotation in the R package qmethod (Zabala 2014). The number of factors to be extracted was determined using the scree plot, the eigenvalues, and informed by prior knowledge (McKeown & Thomas 1988). Four factors were chosen in the initial solution; however, factors 3 and 4 were similar in nature because they loaded on the same statements. I therefore re-ran the analysis, this time choosing a solution with 3 factors, which was also supported as a potential solution by the scree plot and eigenvalues larger than 1 (McKeown & Thomas 1988). One respondent was not flagged for any one of the factors. After identifying the factors, the three perspectives were interpreted together with the interviews to characterize each perspective and identify differences.

Finally, I returned to Seychelles to explore and validate my characterization of the emergent perspectives. I conducted follow-up interviews with 11 individuals from different organisations involved in the blue economy in Seychelles. Of these 11 respondents, 5 had participated in the initial interviews and the complete online survey (consisting of both the social network survey and Q methodology ranking exercise), 3 respondents had taken part in the initial interviews and the social network survey, one respondent had only completed the social network survey, and two were new respondents that served as expert interviews. The additional respondents also served to add fisheries and economic development perspectives; sectors that had lower representation in the previous stage. These interviews thus served to sense check and validate the blue economy perspectives found with the Q methodology.

Type of organisation	Number of organisations in MSP	Initial interviews	Invited for both surveys	Social network survey	Q-method survey	Follow-up interviews
Fisheries	12	4	4	3	1	3
Economic Development & Tourism	12	3	5	2	1	2
Conservation & Environment	14	7	13	8	7	1
Blue Economy	2	4	7	5	3	5
TOTALS	**40**	**18**	**29**	**18**	**12**	**11**

Table 4.1 Actors involved in Seychelles blue economy, interviewed and surveyed in this study

Who or what perspectives are influencing the blue economy in Seychelles?

Information, resources, and ideas tend to spread through formal and informal networks. Actors, based on their position within a network, can thus exert a greater or lesser influence over how information, resources, and ideas spread through a network (Rogers 2010; Evans et al. 2017). By examining actors and their relative positions in a network, processes around power and influence can be explored (Freeman 1977), especially where actors are diverse and have potentially different views on environmental governance strategies such as the blue economy. I used network analysis to examine how actors, involved in the blue economy in Seychelles but with different perspectives on the blue economy, share information and resources, and ask how influential this sharing of information and resources is perceived to be.

Actors identified as involved in Seychelles' blue economy were presented, via an anonymised online survey, with a list of organisations (from the MSP plus any other Seychellois or outside organisations that were mentioned in the initial interviews) and asked, in the context of their work in the blue economy, which organisations they 1) provide with information; 2) receive information from; 3) provide with resources, and; 4) receive resources from. Respondents were subsequently asked *how often* they share this information and resources, and *how influential* this information and resource

sharing is in their work. All respondents had the opportunity to include additional organisations not specified in the list. In total, 18 respondents completed this part of the survey.

Further analysis

I created relational matrices based on reported information and resource sharing ties to calculate how influential, based on their position in the network, the individual actors are, and plotted these relationships in CytoScape (Shannon et al. 2003). Specifically, I used a 'betweenness centrality' metric that calculates the number of times an actor (node) is on the shortest path between two other actors (nodes). When an actor (node) is on the shortest path between two other actors (nodes), they can be thought of as influential in connecting these actors to each other. Betweenness centrality thus provides insight into the capacity of an actor to connect groups that are otherwise distinct (Freeman 1977; Mbaru & Barnes 2017). In the case of information and resources flowing, actors that have high measures of betweenness centrality can be said to be important in transferring information or resources between others, or to act as brokers (Freeman 1977; Borgatti et al. 1998; Butts 2008).

I used the 11 follow-up face-to-face interviews to; discuss the information and resource sharing network; explore and validate influential connections between actors, and; identify sources of contestation or conflict. These interviews further served to triangulate and validate the influence of individual actors as indicated by their betweenness centrality and the flows of information and resources. I presented the networks to the 11 respondents and asked if the network data accurately represented flows of information and resources in Seychelles, and how influential the flows and actors are.

I interpreted the flows of information and resources in the context of the blue economy perspectives found in Seychelles, in order to gain insight into the distribution and influence of these perspectives across the network of actors involved in Seychelles blue economy. By combining the perspectives with the analysis of influence through betweenness centrality, I was able to identify what perspectives

the most influential actors hold. This helped me to answer the question of how influential the different perspectives are in the network of actors involved in the blue economy in Seychelles.

4.4 Results and Discussion

Perspectives on the blue economy in Seychelles

The Q method provides evidence of at least three different perspectives amongst national policy practitioners in Seychelles[5]. The perspectives identified are: 'Supportive in principle, critical in practice', 'Pragmatic and accepting', and 'Idealistic'.

Supportive in principle, critical in practice

Three actors from blue economy-specific organisations, one fisheries organisation, and three conservation and environment organisations loaded on this factor. This perspective was characterised by a critical attitude towards the blue economy in practice, but not in principle as conservation linked to development. This is expressed in their recognition that 'conservation is a hard sell', and resignation that 'the only way to sell it [conservation] is through sustainable development' (29**, +2, Table 4.3).

> If we want to keep on doing conservation, we have to rebrand it as something much more relevant to the economy, or else it would die on its own [I-11]

Although they strongly reject 'financial reasons for environmental protection' (2, -3, Table 4.3), they also accept that 'economic growth afforded by oil and gas exploration can be used to advance sustainable development whilst meeting environmental challenges created through these activities' (25*, +2, Table 4.3). However, the respondents in this group are concerned with how the blue economy in Seychelles is currently proceeding. They view the motivation behind the blue economy as

[5] Table 4.3 shows the statement Z-scores and the normalised scores for each statement. In the discussion of the perspectives, numbers represent the statement numbers that are distinguishing that particular factor, followed by the normalised score. An asterisk is included in the text when the statement distinguishes a factor/perspective significantly from the other factor(s)/perspectives (* means p = 0.05, ** means p = 0.01). Qualitative interview data are reported as "I-#", with # denoting the interview that is the source of the data. This reporting method follows recommendations from Zabala et al. (2018) and examples from Holmes et al. (2017) and Fisher and Brown (2015).

'Seychelles running away from debt, rather than moving towards better protection of the ocean' (21*, +3, Table 4.3), particularly as they do not see 'protection and recovery of ecosystems as a priority' in the blue economy (5**, -3, Table 4.3). Overall, this perspective sees the potential for the economy to work for the environment in Seychelles, but is aware of key tensions that exist in practice. This is expressed in their acceptance of trade-offs between economy and environment, combined with pessimism about the motivation of blue economy actions such as the debt-for-nature swap and a perceived lack of attention for protection and recovery of ecosystems:

> [The blue economy is about] income, money (…). It's not about how we are going to protect [the environment], [or] how we get equality, that's what I am saying. [I-05]

This indicates that those that pioneered the blue economy in Seychelles – the specific blue economy-institutions and organisations – are now amongst those showing resistance against the practical implementation of the concept, and would like to see changes, not in the least in the way they have been involved:

> So many people, I will say it openly, that so many people involved in the field, in the subject, we were put aside a bit too much. And then all of a sudden the blue economy happened, with a new group, and it was a bit disturbing to many people. [I-02]

Pragmatic and accepting.

Three actors, all three working in the conservation and environment sector, were characterised by a less critical and more pragmatic attitude towards the blue economy in practice and the role it can play in conservation. This factor believes that the 'preservation of Seychelles' unique and pristine marine environment is core to the transition to a blue economy' (22**, +2, Table 4.3), which shows their belief in the conservation focus of the blue economy:

> The blue economy is meant to give a better quality of life to people. So that means more money their hands, living better. But by protecting the environment. [I-09]

They also think that 'economic growth afforded by oil and gas exploration can advance sustainable development whilst meeting environmental challenges created through these activities' (25**, +3, Table 4.3), which highlights their belief in the development side of the blue economy. However, this perspective also relatively strongly disagrees that 'working with economic sectors (including fisheries) is the best way to do conservation' (13*, -3, Table 4.3). Overall, this perspective is characterised by an optimistic view that the economy can work for the environment. This perspective regards economic growth as a way to advance conservation – not by 'mainstreaming it into the economy' (17**, -2, Table 4.3), but by transferring funds. The blue economy is seen as a mechanism to generate this funding:

> If you can generate revenue or income from the blue economy for the environment, at one point they [actors] can say it can be diverted towards them also. [I-05]

In expressing this perspective, actors align with the "Oceans as natural capital" perspective, but also with "Oceans as livelihoods", as indicated by their emphasis on sustainable development. Additionally, these actors express a pragmatic approach to the blue economy as a rhetorical tool – they agree to an extent that the blue economy is a different word for business-as-usual (Table 4.3, statement 7). Some even report using the term with no real foundation:

> Even my [policy document] talks about the blue economy, but if somebody comes and does a mid-term review and asks me what have you with the blue economy, I would have to scratch my head and say I'll get back to you. And then I have to go and see what we have done and try and get a link with the blue economy, stretch it to the limit. [I-06]

Idealistic.

The final perspective, conveyed by an actor that works for an international development organisation, represents an idealistic view of the blue economy and thinks that 'Seychellois are well placed to be the greatest of activists for the blue economy' (1**, +3, Table 4.3), and it is the only perspective that agrees that 'the environment should be mainstreamed into the economy' (17**, +3, Table 4.3). However, they do not believe that this mainstreaming should happen through moving into a market economy and fostering entrepreneurship – they do not believe this is the way to make the blue economy successful (31*, -2, Table 4.3). This perspective is the only one that quite strongly believes that the 'blue economy is fundamentally about social inclusion' (10, +2, Table 4.3). Therefore, the idealistic perspective seems to favour inclusion of the environment in the economy, but through government actions rather than leaving it to the market economy. This perspective points to tensions between neoliberal approaches to environmental governance and the socialist history of Seychelles (Scarr 2000). In contrast to the other two perspectives that consider 'it is wrong to have financial reasons for environmental protection', the Idealistic perspective is neutral about this (2*, 0, Table 4.3):

> I think the only way you will be able to protect [the environment] is through increasing your income, having more resources to protect. [I-06]

This perspective disagrees strongly that the 'blue economy does *not* make a difference on the ground' (15**, -3, Table 4.3). This perspective is the only one that disagrees that 'economic growth from oil and gas activities can advance sustainable development and meet environmental challenges caused by it' (25**, -1, Table 4.3). Furthermore, it feels strongly that 'the blue economy does not have enough attention for the effects of its policies on livelihoods' (6, +2, Table 4.3):

> If we need to cut down a bit on the export of fish, let's do it. Let's do it, let's find alternative ways. Because a lot of the demersal fishing should be for domestic consumption, but a lot of it is being exported. [I-06]

It would seem that this perspective is idealistic about the blue economy, in a narrow definition that does not include oil and gas exploration, and with a strong role for government. It also is the only perspective that reflects livelihoods and engagement, as included in the official definition of Seychelles for the blue economy: "those economic activities that directly or indirectly take place in the ocean, use outputs from the ocean, and put goods and services into ocean's activities and the contribution of those activities to economic growth, **social, cultural** and environmental wellbeing" (Seychelles Ministry of Finance Trade and the Blue Economy 2015, p. 2, emphasis added). In doing so, this perspective is more closely aligned with the perspective of "Oceans as livelihoods" as adopted in Seychelles government communications. It also aligns with the "Oceans as integral to SIDS" perspective, when it champions Seychellois as able to be 'the greatest of activists for the blue economy' (Table 4.3, statement 1**).

There is surprising (given the variety of backgrounds) agreement between the actors involved in Seychelles blue economy policy landscape, with seven of the eleven actors sharing the same perspective. Furthermore, all three identified perspectives engage with the "Oceans as natural capital" perspective as identified by Silver et al. (2015) and Voyer et al. (2018), exemplified by all actors subscribing to the need to express the importance of ocean resources. However, all three perspectives found in Seychelles are outright rejecting the notion of 'putting a price on nature' (Table 4.3, statement 9), which for some is a logical consequence of the "Oceans as natural capital" perspective as expressed in international discourse (e.g. WWF and the Boston Consulting Group value 'ocean assets' at US$24 trillion (Hoegh-Guldberg et al. 2015). However, "Oceans as natural capital" is not the same as having financial reasons for environmental protection, something that is clearly articulated by the majority of the respondents by strongly agreeing that having financial reasons is wrong (Table 4.3, statement 2).

This points to tensions within this natural capital perspective on the blue economy as well as between different proponents of this view. International discourse marries a perceived need to express the

importance of nature in economic terms with actually pricing nature through e.g. valuation of ecosystem services – how could nature otherwise become part of the equation? Despite many NGOs never intending nature to be commodified or financialised (Dempsey 2016), as discussed above, for some, this might seem a consequence of the natural capital view. By rejecting efforts to place an economic value on nature, Seychelles is critical of the 'selling nature to save it' maxim (McAfee 1999) and distances itself from the mainstream "Oceans as natural capital" perspective. This points to an alignment with academic critique on the concept coming from policy and practice.

An important cause of this critical stance might be the difference between the abstract level at which the blue economy is discussed in international discourse, at conferences and within other international fora, and the reality of on-the-ground work of implementing the blue economy. Whereas internationally, each of the perspectives identified in the blue economy discourse is accepting of the triple bottom line (environment, social, and economic progress), in Seychelles, not all perspectives are so accepting of this premise. The different international perspectives bring to the fore different aspects of the triple bottom line objective without much consideration of potentially conflicting priorities (Silver et al. 2015; Voyer et al. 2018). Whilst this facilitates communication and collaboration, in reality the presence of multiple competing priorities means that tough choices are required. In Seychelles, proponents of Factor 1 express concern about the balance of the three pillars, and worry about trade-offs. The second factor is much more optimistic about win-win-win situations, whereas the third factor seems to share the idealistic view often expressed in international fora.

Despite actors in Seychelles expressing views that partially overlap with internationally identified discourse and perspectives on the blue economy, there are many differences, likely caused by a more practical approach to the concept. Additionally, perspectives similar to "Oceans as good business" and "Oceans as drivers of innovation" do not emerge in Seychelles (Table 4.3). This means that firstly, Seychelles has its own specific interpretation of the blue economy, and secondly, a large part of the scientific discourse about the blue economy does not directly apply to Seychelles. Indeed, some

international perspectives on the blue economy are met with resistance in Seychelles, for example to the statement that says: 'moving into a market economy and fostering entrepreneurship will make the blue economy a success' (Table 4.3, statement 31). When combined with a network analysis of actors in Seychelles, it becomes apparent that the most influential actors in the information network have a "Supportive in principle, critical in practice" perspective on the blue economy (Figure 4.2). These actors are influential in the network of resources as well, however in this network a "Pragmatic and accepting" perspective is more influential than in the information network, indicating that the potential for change might be limited due to the restrained influence of more critical actors (Figure 4.3).

Seychelles has embraced the blue economy as a concept and has presented itself as a pioneer, which has provided the country with opportunities for shaping the concept. All three perspectives are slightly positive or neutral on the view that the blue economy helped Seychelles to establish their national identity (statement 4, scores: +1, +1, 0 (Table 4.3)). This optimism about the blue economy and the pioneering role for Seychelles might explain the converging thoughts on the way in which the blue economy is seen: all respondents can be broadly categorised as supportive of the "Oceans as natural capital" view, but either see the blue economy as 'economy *for* the environment' or 'economy *and* the environment'. The blue economy signals acceptance that environmental and economic outcomes are linked. However, differences of opinions in whether the relationship between the economy and environment can be mutually beneficial (economy for the environment), or comprises separate policy realms to be pursued simultaneously (economy and the environment) have played out in the environment sphere previously (Adams et al. 2004), what is important in developing effective and equitable policy is that clarity and transparency exist in how organisations view these relationships. All respondents see Seychelles as an actor that can set the agenda, and they agree that that 'financing conservation with money from abroad means a loss of sovereignty' (statement 14, scores: +2, +3, +2 (Table 4.3)). This shows the desire for Seychelles to steer the blue economy locally. It has been able to do so, for example through the debt-for-nature swap that was finalised in

2015 and which was presented by Seychelles in the context of SIDS EEZs as new frontiers – a way of framing that attracts attention from NGOs, but also investors (Silver & Campbell 2018).

Seychelles has taken the blue economy as an opportunity to position itself as influential on the international stage. In doing so, it is shaping and redefining what the blue economy means for Seychelles and beyond. However, despite broad agreement, there are divergent perspectives as well. I identified three distinct perspectives on the blue economy in Seychelles. Although it is generally recommended to only consider factors on which at least two respondents are loading, because Q methodology focuses on shared perspectives rather than individual views (McKeown & Thomas 1988; Watts & Stenner 2005), in some situations, when there is a theoretical or practical justification, using a factor with only one *exemplar* can be justified. I believe this is the case here: only one respondent loaded on factor 3, yet this view was kept as a separate perspective. The reason for keeping 3 factors is that the respondent loading on factor 3 was the only representation of the economic development and tourism sector in the Q methodology survey. Moreover, this respondent loaded strongly on factor 3 (Table 4.2) and not significantly on either of the other two factors when reducing the number of factors to 2. This finding also points to a need to elicit more development perspectives on the blue economy in Seychelles – perspectives that are lacking both because of underrepresentation in the sample, but also because of non-response.

Q-sort factor loadings			
Respondent	***Factor 1***	***Factor 2***	***Factor 3***
blue economy 1	**0.786**	0.084	0.184
Conservation & Environment 1	0.444	**0.615**	0.336
blue economy 2	**0.584**	0.066	0.068
Conservation & Environment 2	-0.088	**0.803**	0.162
Economic Development & Tourism 1	0.047	-0.035	**0.866**
Conservation & Environment 3	0.285	**0.742**	-0.202
Fisheries 1	**0.497**	0.276	-0.067
blue economy 3	**0.621**	0.343	0.095
Conservation & Environment 4	**0.611**	0.138	0.522
Conservation & Environment 5	**0.843**	0.019	0.115
Conservation & Environment 6	0.358	0.57	0.503
Conservation & Environment 7	**0.791**	0.182	-0.141

Table 4.2 Q-sort factor loadings per respondent

All actors representing blue economy-specific organisations (organisations that were either founded as a result of the blue economy agenda or have the blue economy as the focus of their work) expressed a "Supportive in principle, critical in practice" stance on the blue economy. In addition, there are three actors from the conservation and environment sector that share this perspective. The other three actors from the conservation and environment sector load on the second perspective and are therefore more pragmatic and accepting of the blue economy. It is perhaps understandable that some of the organisations from the conservation and environment sector were happy with how the blue economy is playing out in practice, since they might stand to gain from its practical implementation. Benefits might include increased awareness, funds, or recognition. For example, the Blue Grants Fund, which is disbursing grants to projects that "support the stewardship of Seychelles' ocean resources, island life and blue economy" (The Seychelles Conservation and Climate Adaptation Trust 2019) has in its first two rounds predominantly funded organisations and individuals working on conservation projects.

		Factor 1		Factor 2		Factor 3		
Statement		*Z*	*norm*	*Z*	*norm*	*Z*	*norm*	*Dist. and cons*
1	Seychellois are well placed to be the greatest of activists for the blue economy.	-0.82	-1	-0.17	0	1.87**	3**	f3
2	It is wrong to have financial reasons for environmental protection, as within the Marine Spatial Plan and the debt-for-nature swap.	1.72	3	1.23	2	0*	0*	f3
3	Money is often dictating blue economy policies.	-0.08	0	-1.80*	-3*	-0.62	-1	f2
4	The blue economy has helped Seychelles establish the national identity. It is the Seychellois way of managing the environment.	0.6	1	0.64	1	0	0	cons
5	Protection and recovery of ocean ecosystems and biodiversity are a priority in the blue economy.	-2.32**	-3**	0.90	1	0.62	1	f1
6	The blue economy does not have enough attention for the effects of its policies on livelihoods.	0.48	1	-0.74**	-1**	1.24	2	f2
7	The blue economy just gives a different name to what is "business-as-usual".	0.52	1	1.17	2	0	0	
8	The blue economy makes optimal use of the untapped potential of our oceans.	-0.42	-1	-0.27	-1	0.62	1	
9	By expressing the importance of nature in economic terms, people will think more about the	-0.98	-2	-1.23	-2	-1.87	-3	cons

	consequences of acting upon nature.							
10	The blue economy is fundamentally about social inclusion.	-0.69**	-1**	0.33	0	1.24	2	f1
11	The blue economy fails to take into account the cultural importance of fisheries in Seychelles.	1.29	2	0.43	1	0.62	1	
12	Fishers have a disproportionately large voice in the blue economy, compared to their economic contribution.	0.42**	1**	-0.84	-1	-1.24	-2	f1
13	The best way to do conservation is to work together with the different economic sectors and try to get closer with the fisheries and tourism industry.	-0.86	-2	-1.66*	-3*	-0.62	-1	f2
14	Financing conservation with money from abroad means a loss of sovereignty.	1.59	2	1.86	3	1.24	2	cons
15	The blue economy is good PR - it has put Seychelles on the international agenda. But it does not really make a difference on the ground.	0.11	0	0.75	1	-1.87**	-3**	f3
16	The open market economy gives the public an opportunity to become stakeholders and thereby be involved in blue economy initiatives.	-0.46*	-1*	0.21	0	0.62	1	f1
17	The environment should be mainstreamed more into the economy and general policy making.	-0.64*	-1*	-1.33**	-2**	1.87**	3**	f1,f2,f3

18	Sustainable development is the new generation of conservation.	0.2	0	-0.64	-1	0	0	
19	The blue economy and related initiatives are helping stakeholders to get their voices heard.	-0.16	0	-0.06	0	0.62	1	cons
20	The blue economy should give more recognition to fishers, in correspondence with their importance for the economy of Seychelles.	0.35	0	0.00	0	-0.62	-1	
21	With the blue economy concept and the debt-for-nature swap, Seychelles is running away from debt, rather than moving towards better protection of the oceans.	1.62*	3*	0.90	1	0	0	f1
22	The preservation of our unique and pristine marine environment is core to the transition to a blue economy.	-2	-3	1.22***	2***	-1.24	-2	f2
23	Local communities are not represented enough in the blue economy.	-0.3	0	-0.05	0	0.62	1	cons
24	The goal of the blue economy is to make sure the ocean is utilised for the economy.	0.48	1	0.42	0	1.24	2	cons
25	The economic growth afforded by hydrocarbon (oil and gas) exploration and mariculture can be used to advance sustainable development while meeting environmental challenges	1.23*	2*	1.91***	3***	-0.62**	-1**	f1,f2,f3

	created through such activities.							
26	When it comes to promoting behavioural change, we should be tapping into the intrinsic values that people hold for nature, rather than purely economic values.	-1.1	-2	-0.86	-1	-0.62	-1	cons
27	The blue economy banner is a leverage tool for Seychelles in international fora. It gives Seychelles a disproportionally large voice and works well for receiving funding.	-0.53	-1	-0.97	-2	0	0	cons
28	The blue economy can provide some much-needed coordination between different organisations and stakeholders related to the environment.	-1.01	-2	-1.49	-2	-1.24	-2	cons
29	Marine conservation is a hard sell. The only way to sell it is through development.	1.22*	2*	0.49**	1**	-0.62*	-1*	f1,f2,f3
30	Conservation is good, but we need to keep on the lookout in case the plans become tools to keep fishers away or it turns into land grabbing, like has happened in many other places.	1.01*	1*	-0.90	-1	0	0	f1
31	Moving into a market economy and fostering entrepreneurship will make	-0.19	0	-0.16	0	-1.24*	-2*	f3

	the blue economy successful.						
32	The blue economy is trying to do too many things at the same time: it is about conservation, but also includes things that are in conflict with conservation.	-0.28	0	0.70	1	0	0

Table 4.3 statement Z-scores and normalised scores for each statement for each factor, with distinguishing and consensus statements indicated in the last row

Networks of influence in the Seychelles' blue economy

There are clear differences between the information sharing network (Figure 4.2) and the resources sharing network (Figure 4.3) in the Seychelles' blue economy policy context. The influence of different actors, as captured in the flow of information or resources, tends to be more evenly distributed within the information network, where a higher number of actors were found, with a larger number of connections between them, and no single actor dominating. It is therefore likely that uneven power dynamics have less of an influence on the sharing of information. However, when it comes to the perspectives of the blue economy represented in the information-sharing network, a "Supportive in principle, critical in practice" perspective tends to dominate. Conversely, within the resource sharing network, the "Pragmatic and accepting" perspective are relatively more influential when compared to their own influence in the information network. This can suggest that although there is in principle the potential for change following from critical engagement in the information network, this may be limited in practice, due to a lack of influence in terms of resources from the actors that represent a critical perspective. In addition, the resources network shows potential for conflicts and challenges, as there are a few influential actors, fewer flows between them, and a more mixed perspective on the blue economy. The network structure points to more uneven power dynamics than is the case in the information network.

Using betweenness centrality as the metric for influence in both networks (with node size representing betweenness in the network figures), the analysis shows that government organisations (identified by the dark green nodes), who expressed the "Supportive in principle, critical in practice" perspective, are more influential in terms of information (Figure 4.2). These actors have been pioneering and shaping the blue economy agenda, and have been driving change. The fact that these actors are mostly government organisations indicates that those that pioneered the blue economy in Seychelles are following its development critically, and are not entirely happy about the practical outcomes of blue economy-inspired initiatives. However, there are non-government actors (represented by the light green nodes) that reflect a critical perspective too. The most influential actor (depicted by the largest node and betweenness metric) in the information network is a non-government organisation (betweenness centrality 0.055, Figure 4.2). The second and third most influential actors are governmental organisations (betweenness centrality 0.034 and 0.026, respectively, Figure 4.2). All these actors represent a "Supportive in principle, critical in practice" perspective and have the ability to drive this change through their influential positions in the network.

The only government organisation that represents a pragmatic perspective is far more influential in the resources sharing network compared to the information network (betweenness centrality 0.045, Figure 4.3). Whereas the information network only shows small "Pragmatic" nodes, the only government organisation that represents a pragmatic perspective is far more influential in the resources sharing network (betweenness centrality 0.045, Figure 4.3). This greater relative influence of the government actor with a pragmatic perspective may suggest inertia in actually leveraging change. Whilst there is still potential for change and further development of the concept in the resources network, this potential might be limited due to restrained resources and therefore influence of the critical actors. However, the largest and therefore most influential actor in the resources network is still a critical government actor (betweenness 0.055, Figure 4.3); therefore, the room for change is still there.

The organisations at the periphery of both networks are mostly non-government organisations, denoting a lower influence and less central position than the predominantly government organisations that are influential and central to the network.

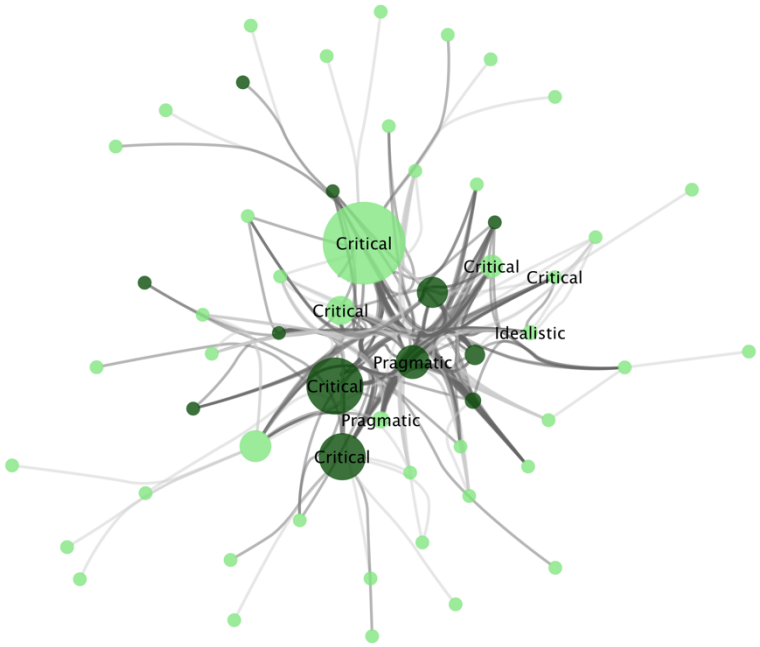

Figure 4.2 information network showing the sharing of information between actors involved in Seychelles blue economy. Node sizes represent betweenness centrality of actors (larger nodes have higher betweenness centrality). Node colours represent organisation type (dark green = government, light green = non-government)

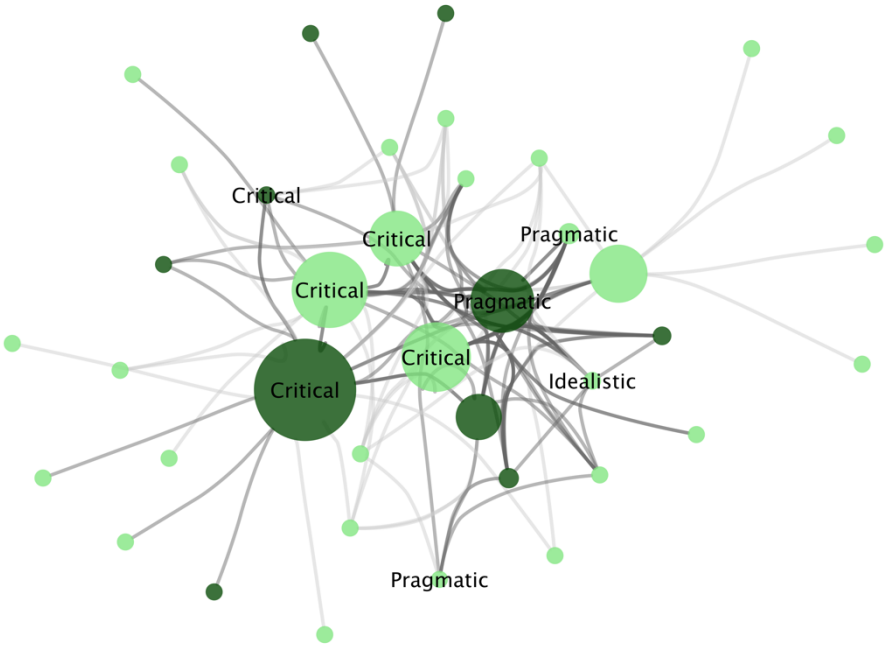

Figure 4.3 resources network showing the sharing of resources (staff, equipment, money) between actors involved in Seychelles blue economy. Node sizes represent betweenness centrality of actors (larger nodes have higher betweenness centrality). Node colours represent organisation type (dark green = government, light green = non-government)

Shaping the future of the blue economy in Seychelles

Despite broad agreement about what the blue economy is, or should be, the analysis here shows that in Seychelles there are still different perspectives on both the practical application and the underlying ideas of the blue economy. This might be due to the acceptance of the blue economy as a reality in the national environment governance seascape that has to be worked with, even if the added benefit is not always clear, as indicated by one respondent:

> We inherited this now. We have to make it work. You see what I mean? But then the people stepping at us say: why the blue economy? What's new? We have always been a blue economy, we have always been ocean-oriented: fishing, sailing, tourism. What's new? So there is (*sic*) people still looking for the new. And then, that's the problem about

being the new, then they are trying to re-invent something to make it new. Then they say: blue economy is more than that. [I-10]

The organisations that are critical of the blue economy in practice, be they government or non-government actors, are influential in both the information and the resources network. This means two things: the implementation of the blue economy is experiencing resistance from within, and from powerful actors; and Seychelles is putting its own mark on the blue economy by taking a perspective that is distinct from the international discourse. The international discourse, despite consisting of several conflicting views, does not have much to say on the possible discrepancy between blue economy in theory, and blue economy in practice. Seychelles, being one of the first countries to actually implement ideas on the blue economy, has experienced the discrepancies in practice, not just between different interpretations of the concept, but also between the concept and its implementation.

The third question of who stands to gain or lose out from the blue economy finds its answer at the intersection of the first two questions – what the blue economy means in Seychelles and who and what perspectives are driving the blue economy in practice. Those actors that might be seen as pioneers of the blue economy in Seychelles, whilst being appreciative of the concept, are not quite happy with how it plays out in practice. Others, like environmental NGOs and environmental government organisations, are more pragmatic and positive about the blue economy, both in theory and practice. The cause of these differences might lie in the fact that the latter stand to gain more from the blue economy in practice, through increased funding and/or continuation of their activities through strategic use of the "buzzword" in their funding applications and other documents, whereas the first group does not see their ideals of the blue economy in principle becoming reality. Moreover, the blue economy in Seychelles has always been characterised by politics, having been introduced by a former president whose party was in power for 12 years, first in a one-party state and later in a multi-party state that was still dominated by them. The fact that only fairly recently a new party has gained power (and only in parliament, not in presidency), coupled with the fact that for many, the blue economy is

synonymous with a project of the old president, adds another layer of complication to the practical implementation of the concept:

> It didn't help that the new president didn't talk about blue economy in his first year of office, now he is starting to articulate it more so we might start to see a real focus on it again, but… [I-01]

> There is a potential risk to the blue economy's longevity in Seychelles, with various transition phases that are going on, so it might be something that is not on a upwards development curve… [I-04]

It will be key for Seychelles to retain its autonomy in the blue economy: this is something that all actors felt strongly about, as expressed by shared agreement with the statement that financing conservation with money from abroad means a loss of sovereignty. This view was expressed in the follow-up interviews as well, by discussing the role of international funding bodies such as the World Bank and the UN:

> What worries me is that they [international funding organisations] will come and push this agenda, and since it [conservation activities/the blue economy] is still supply driven, the people in the Ministry of Finance or the Blue Economy Department will just take it. And it shouldn't be that way. [I-06]

This view is striking when considering earlier findings of the blue economy have pointed towards the opportunities that it offers states in terms of "driving an expansion of capitalist space to the oceans", after which this new "operative rationale" opens up new "governable spaces" (Choi 2017 p. 39).

Framing ocean governance as the optimal configuration of ocean uses (thereby depoliticising the ocean itself) can pave the way for state intervention. This framing has been used before to justify a combined used of public management and private accumulation (Steinberg & Kristoffersen 2018), and it sits uncomfortably with Seychelles' actors. With a historically strong state and sensitivities around the former president who pioneered the concept, the blue economy in Seychelles has always been linked with politics. Moreover, its socialist history and its only recent transition, under IMF guidance, from an "interventionist" economy to a "stable and private sector led" economy (International Monetary Fund 2013 p. 1), means that the use of blended finance and the role of the state in driving this expansion of capitalist space both create discomfort. The concern for maintaining sovereignty might appear paradoxical here when considering the blue economy as a form of governmentality (potentially leaving room for the familiar 'interventionism'). Yet this concern in Seychelles seems to stem from the involvement of private businesses, NGOs, and other international organisations, which is so central to the concept.

Although some concerns were raised about attention to livelihoods, and engagement, these concerns did not define any of the perspectives, and many responses are neutral, suggesting considerations of equity, identity, and engagement are largely lacking. The only perspective that has something to say about livelihoods, social inclusion, and equity, is the "Idealist" perspective, expressed by only one actor. Whereas this actor is idealistic about the blue economy and would like to see it go further on equity, other actors do not share this perspective. Moreover, the only actor that includes these considerations as important, in addition to being isolated, also has a very low influence in either the information or the resources network.

The fact that almost none of the respondents had a strong opinion about any of the statements relating to livelihoods, social inclusion, or equity, shows that at best, this is an overlooked issue within the blue economy in Seychelles. This mirrors findings by Steinberg and Kristoffersen (2018), who raise the issue that concern for equity, purportedly taking a central position within the blue economy, is

often subsumed in the quest for growth and accumulation. This lack of attention for equity concerns might be explained by the fact that most of the actors in the Seychelles' blue economy are government actors, who, although critical, share the same view on the blue economy, leading to a one-sided debate. There is a lack of representation of more diverse actors, especially those representing livelihoods and communities; currently, government and environmental NGOs dominate the field:

> …the environment sector is very oversubscribed with NGOs, I think there are fourteen now registered in the environment sector here. When you look at other sectors, how many NGOs there are, you'll find two in tourism, you'll find one in fisheries. When you think about the scale of importance of that to the economy… [I-04]

The lack of representation is reflected in the marine spatial planning process, which reportedly initially failed to include artisanal fishing representatives, and once it did, not all felt that their voices were heard:

> I have participated in most of these MSP meetings and workshops, and this thing was a done deal, they wanted it through and sealed 2 years ago. We started making some noise and said it's not fair, we have participated, we've given information, and whenever they presented their draft zoning design, whatever we had said – it didn't show it, it wasn't reflected. [I-03]

Through these developments, there is a risk of a breakdown of trust, between different actors, especially in a place that is as small as Seychelles, where interpersonal relationships can be affected in the course of policy-making. This also means that consideration must be given to actors 'outside' the networks presented here, and the extent to which these actors are able to exercise influence over the process. Considering most definitions of the blue economy contain the three pillars of sustainability

(economic growth, environmental sustainability, and social equity), it seems that more attention to this aspect of the blue economy is warranted, and that there is a need for more diverse actors.

Finally, there seems to be a sense of urgency surrounding the blue economy, as observed by Silver et al. (2015) when they point out that there was "a sense of excitement regarding the heightened visibility of oceans at this summit and even among the global citizenry", and that "it may well be the early stage of a longer, power-laden process whereby one discourse about human–oceans relations […] will come to be seen as obvious or logical" (p. 152). This sense of urgency and excitement is also exemplified by Seychelles launching their Blue Bonds recently during the Our Ocean Summit, another 'world first', this time pushed forward by the World Bank and welcomed as investment opportunities by news outlets such as the Financial Times, Business Times, and Reuters (Allen 2018; Mehta 2018; Obulutsa 2018). However, as we saw earlier, this "Oceans as good business" perspective is not shared by any of the actors in the Seychelles policy-making landscape. This raises questions about who gets to decide what the obvious or logical discourse will be, and where that leaves people in small island states. As one respondent said:

> …we had to get the Commonwealth to help us define the blue economy, and we are the ones that are supposed to [know]. [I-10]

4.5 Conclusion

Here, I have demonstrated a high level of support for the blue economy in Seychelles, both in principle and in practice. However, evident is a desire to shape it further, and for Seychelles to seize the opportunity to take control over both the process and the outcome. This view is shared by all actors across all three perspectives. Although there is broad agreement as to what the blue economy represents in Seychelles, important differences exist in its practical application. However, recognition of these differences and their associated incompatibilities is lacking across domains of national policy practice, and even within single perspectives. This lack of recognition of differences and

incompatibilities of different interpretations of the blue economy is not unique to Seychelles, and may indeed characterise this emerging policy arena (Silver et al. 2015).

What does it mean that there are un(der)acknowledged incompatibilities between different interpretations of the blue economy, both within and across scales (international discourse vs. national policy level)? International discourse tends to sidestep this issue, but it gains relevance once applied in local settings. Moreover, it is on the local scale that tensions arise when attempting to bring ocean governance into a managerial realm. This attempt at depoliticising ocean governance, together with optimism about the opportunities that the ocean frontier offers, does not engage with realities of difficult trade-offs between winners and losers. This lack of concern for equity finds it origin in international discourse, but as demonstrated here permeates into local policy settings as well. Space should be given to the question of what a just blue economy should look like, and who gets to decide on the answer to that question (Cohen et al. 2019). Future research must acknowledge the agency of SIDS and other countries that have adopted the blue economy by paying attention to the possible different interpretations of and perspectives on the concept, and to the role of power and influence in the adoption of these ideas.

Chapter 5. Maintaining blue economy hegemony at the global and local scale

5.1 Abstract

The blue economy is a concept that has recently emerged and that is increasingly influential in international and national discourse. Various contested interpretations of the concept exist, and different actors choose to emphasise different aspects of the triple goal of environmental, economic, and social improvements. However, despite disagreement over its interpretations, the blue economy finds support in many different arenas. This chapter explores the position of dominance that the blue economy has reached, and examines how the concept maintains and employs power to stay relevant. It does so by drawing on a mixed-methods approach with 21 semi-structured interviews with people in roles of formal decision making across the fisheries sector, economic development and tourism sector, conservation and environment sector, and specific blue economy-institutions, supplemented by observations from the wider landscape during four months of fieldwork in Seychelles. The results show that in international discourse, the blue economy obtains and maintains its influence through persuasion and the construction of a 'common sense', a productive way forward that is capable of achieving triple wins. Within this narrative, oceans are undergoing a reconfiguration as economic frontiers, and the blue economy places economic growth from oceans central in capitalist hegemony. Maintaining the blue economy as a powerful concept on the ground is done through social power relations. The role of the blue economy as a boundary object contributes to the depoliticisation of discussions on a shared vision. This allows Seychelles to continue to use the concept despite simmering dissent. The dominance of the blue economy at the international stage means that associating with it brings Seychelles visibility and influence. The role of the concept in navigating tensions makes it difficult for counter-hegemony to arise, although alternatives are emerging elsewhere, such as blue justice. However, fundamental change is needed to re-politicise environmental decision-making and explicitly discuss the values and images attached to the blue economy.

5.2 Introduction

The ‘blue economy’ is an emerging concept that has been heralded as a new approach to ocean governance, mirroring the more frequently cited ‘green economy’. The blue economy refers to a broad set of policies that aim to support ocean-based economic activities that provide simultaneous improvements for economic, social, and environmental outcomes (Silver et al. 2015). Even as the idea of the blue economy has gained popularity, it is not very well understood and is contested in many different arenas (Silver et al. 2015; Voyer et al. 2018; Schutter & Hicks 2019). The versatility of the concept means that some advocates are using it to describe oceans as economic frontiers, whereas others emphasise the unique biodiversity that needs to be protected (e.g. WWF 2015; Jolly & Stevens 2016; The Economist Group 2018). This has led to many different interpretations and definitions of the concept, from a variety of different actors, ambiguity that can make it difficult to understand its influence on policy and practice.

The ‘oceans as good business’ interpretation of the blue economy, often propagated by economically powerful states and industry, emphasises innovation, entrepreneurship, and close collaboration with the private sector, paralleling approaches common in its terrestrial counterpart, the ‘green economy’ (Silver et al. 2015; Voyer et al. 2018). It also holds the same optimistic belief in growing the economy and protecting the environment simultaneously, which has been argued to obscure trade-offs in favour of supposed win-win outcomes (Phelps 2015; Wanner 2015). As such, the blue and green economy share a foundation in ecological modernisation thinking, whereby economic growth and environmental protection can go hand-in-hand through incorporation of environmental issues into markets (Huber 1982; Jaenicke 1984; Mol 1996). By proposing that win-win outcomes are achievable through ‘modernising modernity’ (Mol 1995 p. 37) and reliance on technology and innovation, ecological modernisation has been argued to further promote a profit and growth paradigm, obstructing the fundamental change required to achieve actual sustainability (Davies & Mullin 2011; Wanner 2015; Blühdorn 2017). Indeed, the blue economy emphasises that “since a large proportion of marine resources is believed to have remained untapped or unexplored [..] there is a widespread

conviction that future growth will be contingent on the efficient utilisation of those rich ocean resources" (Roberts & Ali 2016 p. 3).

It remains unclear how a concept that has received considerable critique and struggles with paradoxical aims, still remains dominant in contemporary seascapes. How does the concept maintain and employ power to stay relevant, and how does the reconfiguration of oceans as economic frontiers contribute to this power? Drawing on insights from neo-Gramscian and Foucauldian thinking, I explore how the blue economy gains influence, and what the power of the increasingly hegemonic blue modernisation narrative is enabling or constraining. I first examine how the blue economy as a concept serves to maintain hegemony, and then focus on how social interactions in national governance settings contribute to maintaining this consensual power dynamic.

5.3 Conceptual framework

Both at the global stage and in national governance settings, the blue economy has the status of a boundary object. Boundary objects are concepts that can be applied in a structured way in specific situations, but are also versatile enough to appeal to many different actors as an idea (Star 1989). They are frequently applied in environmental governance, taking the shape of, for example, resilience, natural capital, ecosystem services or green infrastructure (Åkerman 2005; Brand & Jax 2007; Abson et al. 2014; Garmendia et al. 2016). These concepts are not coincidentally often aiming to introduce more ecologically aware thinking into the economic dimension, as boundary objects serve to facilitate cooperation between different social worlds (Åkerman 2005).

The blue economy, with an interest in economic, social, and environmental issues simultaneously, benefits from being a broad concept, finding supporters in different arenas (e.g. UNEP et al. 2012; OECD 2016; The World Bank & United Nations Department of Economic and Social Affairs 2017; The Economist Group 2018). However, its status as a boundary object also means that the blue economy concept navigates a thin line between being versatile and inhibiting explicit discussions

about incompatible interpretations (Christiansen & Schutter 2019). Whilst boundary objects "allow different groups to work together without consensus" (Star 2010 p. 602), for the blue economy this also means that its status as a boundary object allows it to appear apolitical. It seems apolitical because, through its very plasticity, it can stifle debate around the difficult choices and trade-offs that can be made between the three different dimensions of the blue economy. Yet, this vagueness that obscures choices does not automatically mean that the concept as a representation is not useful (Star 2010), or that it is not making things happen. Boundary objects can become a source of power by creating a 'common sense' in which conflicting interests are resolved rhetorically (Gramsci 1971).

I adopt the Gramscian concept of 'passive revolution', because it is a useful approach to studying how challenges to the dominant capitalist order are neutralised and absorbed (Wanner 2015). The argument of win-win situations has worked to neutralise arguments about limits to growth, muddying trade-offs between economic and environmental sustainability. As such, capitalist hegemony is maintained, allowing for continued and even accelerated exploitation of what is now called 'natural capital' (Wanner 2015). Key to the concept of passive revolution is the influence of international support forged by powerful states, with less powerful states on the receiving end of developments and ideas from other countries (Gramsci 1971). These less powerful states subsequently incorporate aspects from the hegemonic model, which facilitates the expansion of its ideology (Cox 1983). What constitutes 'the state' is increasingly expanded to include international civil society, in which a transnational system of production and financial institutions such as the World Bank and the IMF exercise global hegemony at the cost of state sovereignty (Gramsci 1971; Cox 1983).

The blue economy can be seen as a new iteration of the passive revolution facilitated by the green economy, in which the hegemony of capitalism is further embedded in the ocean. Oceans, more than terrestrial ecosystems, are often conceptualised as placeless, regarded from land as 'out there' (Anderson & Peters 2014). This has led to images of oceans as dangerous and chaotic areas of wilderness, frontiers to conquer, or as places to traverse (Steinberg 2001). A view of oceans as separate from land, and humans, is instrumental in blue modernisation: it maintains modernity's

separation of humans and nature, reconfiguring ocean spaces into new and contested territories that are simultaneously new economic frontiers and areas of enclosure (Steinberg 2001; Satizábal et al. 2020). In doing so, the emergence of the blue economy has been observed to facilitate continued capital accumulation (Choi 2017) by offering technology and innovation as a way out of frictions and conflicting interests caused by the territorialisation process of the UNCLOS (Mallin & Barbesgaard 2020).

However, at the national level, more is needed than a hegemonic ideology in order to steer conduct, which is why combining neo-Gramscian thinking with Foucauldian insights on power in social interactions can be useful (Okereke et al. 2009). The blue economy internationally has attracted attention, and countries like Seychelles have aligned themselves closely with the idea. However, in order to open up the process of negotiating power relations, it is necessary to acknowledge that power in environmental governance is not just about state coercion, and rather about "who gets what, when, and how" (Lipschutz 2005 p. 751). In order to explore this power through social agency, a closer look is needed at the specific context and social relations within national environmental governance (Okereke et al. 2009). Power can therefore be approached as something that is productive: rather than being something that can be accumulated, it is making things happen and can be traced as such (Lipschutz 2005).

5.4 Methods

I conducted face to face semi-structured interviews with 21 people in roles of formal decision making across the fisheries sector, economic development and tourism sector, the conservation and environment sector, and specific blue economy institutions. Sampling followed a snowballing approach to connect to as many actors as possible involved in policy and practice around the blue economy in Seychelles. The interviews took place in the context of a larger project, during which I spent a total of four months in Seychelles, and which included 130 household interviews and 50 resource user interviews (Chapter 4). Therefore, data collection followed a mixed methods approach, consisting of observations and impressions from the field in addition to the 21 interviews. Interviews

were recorded and transcribed, and together with observational notes from meetings, presentations and discussions coded into emergent themes. These were themes that linked both to power of the blue economy as a representation of hegemonic ideology, and its translation into on-the-ground interactions that determine implementation outcomes (i.e. the negotiation of power in social interactions). The emergent themes were therefore analysed to explore how respondents viewed the blue economy concept in an international context, and how they perceived Seychelles to play a role in international discourse. I further zoomed in on the process of aligning with the concept, and how this alignment was both influenced by the power of international hegemony and facilitated Seychelles to carve out a role for itself as a pioneer, thereby gaining attention. In addition, the data were analysed for themes that gave insight into local processes of decision making. I was mostly interested in tracing social interactions, therefore I focused on data that spoke about respondents' relationships with others, and their interaction in fora such as the MSP process.

My positionality inevitably influenced data collection and analysis. As a researcher, it was possible to navigate between different spaces of power, gaining access to actors on different sides of the discussion. During the interviews, it became evident that many respondents were engaging in unique conversations, and shared more with me than they would have with their peers. This dynamic created a mutual opportunity: as a researcher I was able to collect data, and the respondents were able to promote their views. The timing of the interviews had a positive impact on this access, as blue economy policy-making was still in the early stages of articulating its aims and meanings. Although political tensions were present, they were less pressing than they are with elections approaching and implementation of the blue economy at a later stage.

5.5 Results and discussion

The blue economy concept is maintained as influential at the international stage by persuasion, through the presentation of the concept as a common sense, and a productive way forward. However, it needs to be maintained on the ground as well, through power in social relations. I found that despite a sense that there are critical voices as Seychelles is shaping the blue economy (Schutter & Hicks

2019), there is a lack of public dissent on the ground. Common themes that emerged from interviews and observations were: the pervasive role of an international concept for the visibility and influence of Seychelles; the function of the boundary object status in obscuring trade-offs and facilitating depoliticisation and communication; and related to that, consensus on shape (the term blue economy is used widely) but not on content, which shows a simmering discontent that is expressed only privately (Chapter 4). As a result, the concept, having achieved hegemonic status on the international stage through its persuasive and all-encompassing character (the promise of triple wins), persists at the national stage.

The blue economy as negotiation for power

The emergence of the blue economy as a powerful narrative cannot be seen in isolation from interstate politics, achieving its power through persuasion and consent rather than coercion, leading to hegemony of ideas (Gramsci 1971; Cox 1983). Consent is achieved through absorbing challenges to the dominant capitalist order by providing an attractive and internationally supported alternative narrative. The status of boundary object enables this widespread adoption and acceptance of the term, despite interviewees stating that "it is not very clear what they mean. It is an amorphous concept"[6]. The ambiguity in the concept works to muddy the contradictions of the capitalist mode of production, thus raising support for the idea that continued and accelerated exploitation of oceans is possible (and necessary) at the same time as more environmental protection. The adoption of the blue economy as a new conceptualisation of the ocean as a (sustainable) development space was thus expressed in Seychelles: "The blue economy (...) embraces the vista of untapped potential that is available through enhanced exploration and sustainable exploitation of our oceanic spaces" (Michel 2014). As such, the blue economy offers a way to align oneself with the hegemonic core, incorporating the blue modernisation narrative that ensures the maintenance and expansion of the dominant (capitalist) mode of production (Cox 1983). In addition, another senior IGO representative said that "Everyone is

[6] IGO representative

talking about it; it is good PR"[7], indicating the importance of the sheer volume of blue economy ideas promoted.

The concept has become further established as hegemonic by the promise of triple wins and its presentation as common sense. Respondents commonly mentioned that interest in sustainability in the oceans seemed to be *de rigeur* at the moment and that it made sense to jump on the bandwagon: a government representative in the environment sector said that "… right now there is a lot of interest in ocean matters, it seems like the resources are going towards those things."[8] Thus, consensus is created, which has been argued before to serve hegemony when people "come to accept the hegemonic project as their own even though in critical terms the project serves to reproduce the dominance of the ruling elite." (Okereke et al. 2009 p. 67). Power thus does not rely on coercion but on consent, and the 'common sense' created by international blue economy discourse heavily relies on presenting the blue economy as a rational and modern way of environmental governance. As such, the term carries agency, as local actors feel compelled to use it and perpetuate the discourse: "Even my [strategic document] talks about the blue economy, but if somebody comes and does a review and asks me "what have you done with the blue economy?", I would have to scratch my head and say I'll get back to you. And then I have to go and see what we have done and try and get a link with the blue economy, stretch it to the limit."[9] The adoption of the concept leads to the tacit consent that is a key component of Gramsci's 'passive revolution': the stimulus to incorporate this 'new' approach to ocean governance comes from growing international support which has the power to "transmit their ideological currents" into national governance settings (Gramsci 1971 p. 116). The 'opening up' of national economies and interventions such as structural adjustment programs, which have taken place in Seychelles, further solidify the power of the global capitalist mode of production (Taylor 2004).

[7] IGO representative
[8] Government representative
[9] IGO representative

Not only is the blue economy presented as common sense, but it is perceived as actively serving Seychelles' geopolitical interests. Through its weight on the international stage, countries that embrace the blue economy concept find themselves at the centre of a new wave of ocean governance. For Seychelles, the concept has meant increased international attention, an opportunity to present itself as a pioneer on a global stage, and in doing so gain influence and draw in finance (Schutter & Hicks 2019). The blue economy has put Seychelles on the agenda, as evidenced by mentions from the World Bank, and the Commonwealth (e.g. Damanaki & Kemper 2018; The Commonwealth 2019), as well as by recurring themes during interviews. Interviewees mentioned that "Government will say that the MSP, SeyCCAT and the debt swap are all part of the larger blue economy agenda, but what the blue economy is mostly doing is raising the profile of Seychelles."[10] In addition, the blue economy appeals because of the promise of a new source of income: "It shows that it can bring in money"[11]. The power of persuasion and the benefits that the blue economy offers in terms of influence and income has meant geopolitical competition between small island states. Other countries were mentioned as competitors in the blue economy context, for instance Kenya: "Seychelles is the blue economy champion of Africa, yet Kenya is now pulling the lead in a position paper for the African Union. Kenya is now able to hijack the conversation. It's a missed opportunity to have the country's interests represented."[12] The importance of maintaining the status of pioneer and champion of the concept was also mentioned: "Maybe it's part of the whole competitive thing, that we have to keep this blue economy, because it keeps you relevant, it keeps your activities in view of everybody else and then they still engage with you."[13] As a result, actors that are enrolled in the now hegemonic project are actively working to maintain it, as the ties to this internationally successful project have become instrumental in maintaining (perceived) geopolitical influence.

[10] IGO representative
[11] IGO representative
[12] NGO representative
[13] Government representative

Maintaining consensus on the ground

The blue economy's status as a boundary has an impact on the ground in three ways. First, its broad meaning brings confusion and ambiguity, which makes it difficult to disagree with (similar to the international discourse). Second, consensus is maintained through employing the blue economy as a boundary object to depoliticise discussions, a strategy that finds fertile ground in historical tensions and a lack of trust. Third, although dissent is indeed present in Seychelles, the use of stakeholder consultations in planning and implementation has further depoliticised the debate and trade-offs, thereby manufacturing consent.

Maintaining consensus is important, because it allows for the continued use of the concept which not only has become powerful in a hegemonic sense itself, but also offers power to Seychelles in terms of visibility and relevance. In international arenas, Seychelles and other countries aligned with the blue economy concept speak with a voice of enthusiastic support for "transforming oceanic spaces into development spaces" (Seychelles State House 2015). The blue economy has become an important project to be associated with, providing legitimacy and relevance at the international stage and opportunities for 'innovative finance'. The international discourse has Seychelles locked in, meaning that consensus that this is a good idea needs to be maintained locally, too. The process of negotiation at the national level provides an avenue for exploring how power relations are employed to maintain this delicate balance between support and opposition for the blue economy (Lipschutz 2005).

The most common theme in interviews was the lack of clarity on what the blue economy actually *is*. One of the household interview respondents expressed this clearly, stating "I don't think anybody knows fully what it means". The lack of a clear definition and the use of the concept as a boundary object without clarity on concrete action has spurred critique concerning the hollowness of the term, mirroring the previous debates about the usefulness of boundary objects in the environment sector (Åkerman 2005; Brand & Jax 2007; Garmendia et al. 2016). The lack of clarity has also meant that the promise of 'triple wins' and 'more money for everyone' could be maintained, hiding trade-offs

and suggesting that the blue economy has something for everyone, "enough to ensure conformity of behaviour in most people most of the time" (Cox 1983 p. 164).

Boundary objects are useful in climates where trust and communication are difficult, precisely because it requires no consensus for groups to still be able to work together (Star 2010). This is especially useful in places like Seychelles, which in the past featured a strong and very present state (Bulbeck 1984). During the interviews, despite a focus on the blue economy, some respondents spent time explaining the history of internal politics in Seychelles, as an important part of understanding domestic interactions with the blue economy concept. Several linked this political context to a culture of distrust responsible for suspicion and a lack of communication; several interviewees suggested that this has caused a refusal or inability to explicitly discuss trade-offs and choices in the blue economy. Respondents spoke of a fear of offending others, which inhibits explicit discussions, and suggested that this might be a leftover from the past, which saw a coup d'état and a one-party state. Indeed, one interviewee explained that they were holding back in discussions in order not to escalate disagreements, and said: "sometimes you're scared of being negative, you want to respect other people's views"[14], and another described the delicate balance as follows: "[…] for example with the MSP, we have to be very careful, we don't want to be in someone's way, we don't want to be too tainted you know."[15] The result is that not many people are publicly critical of the blue economy. Rather, there is a simmering dissatisfaction with the current hegemonic status of the concept, expressed in competing perspectives (Schutter & Hicks 2019).

In Seychelles, the MSP process and in the consultation process for the blue economy roadmap have served to depoliticise environmental governance through a focus on the technical process of planning. There were mentions of "meetings for the sake of meetings", during which no explicit discussions on choices within the blue economy were held. Interviewees explicitly spoke of "choreographed participation" (Flannery et al. 2019). For example, one interviewee said: "There are so many

[14] Government representative
[15] Government representative

processes (…) that are just there to validate some fait accompli. They say they will do stakeholder consultation, and they just want you to fill out an attendance sheet (…). I've attended most of the meetings and when I look at the report, it says they had concluded the stakeholders' consultation successfully. [But] I cannot remember one meeting that ended with a handshake."[16] Although the sentiments expressed by stakeholders indicate disagreement with the process as well as the content of blue economy-inspired governance, respondents did not see their dissent reflected in real changes. Thereby, discussion on a vision for the blue economy and trade-offs is stifled by its status as a boundary object, because it offers the illusion of collaboration whilst actually depoliticising the debate (Flannery et al. 2019). As a result, consensus takes the shape of the manufactured consent of stakeholder consultations, in which the hegemonic ideology of the blue economy takes precedence over explicit discussion of trade-offs.

As a result, the depoliticisation of the blue economy discourse and the MSP process is influenced not only by their role in a currently hegemonic narrative, but also by historical tensions and interpersonal relationships. Past politics inhibit explicit political discussions on winners and losers in the blue economy today. Although the blue economy as a boundary object has facilitated the navigation of tensions, "[t]he problem of rhetorics, however, is that a strategic choice [of a boundary object] is always a constitutive choice also." (Åkerman 2005 p. 44). Taken together, the blue economy offers a seemingly depoliticised space where there is no need to discuss trade-offs, but instead win-wins can be achieved. Although depoliticisation and triple win fantasies ensure conformity and buy-in, they result in an impasse in developing common aims and understandings for the blue economy and a transfer of power to international civil society (as an extension of the state), instead of local civil society. Thereby, depoliticisation obscures the tacit consent with the role that the blue economy plays in maintaining capitalist hegemony.

Finding counter-hegemony

[16] NGO representative

Blue modernisation reconfigures oceans as new economic frontiers and places of enclosure simultaneously (Steinberg 2018; Satizábal et al. 2020). The combination of the important role of the blue economy in giving Seychelles a platform internationally, the appeal of win-win situations and the use of the boundary object to facilitate depoliticisation means there is no coercion but rather a consensual agreement with the use of the term blue economy. However, this does not mean that the concept is not contested. Narratives of oceans as placeless frontiers are difficult to sustain at the implementation phase of the blue economy, as resource users are actually closely connected to and familiar with oceans. In addition, although trade-offs may be avoided at the discursive (inter)national policy levels, on-the-ground implementation will have to show its colours concerning impact on resource users and others. A boundary object cannot itself be implemented, and local political models are more difficult to adopt than hegemonic ideology, leading to the contradictions and contestations at the local level (Cox 1983). In this light, it is not surprising to find dissatisfaction with the ideas and processes of the blue economy in Seychelles.

Indeed, from earlier research a sense emerged that Seychelles was shaping the blue economy, and resisting aspects of the international discourse (Schutter & Hicks 2019). However, observations from the broader landscape indicate that these views are expressed only privately. In the wider context of implementing the blue economy, dissatisfaction appears to be suppressed by employing the power of persuasion and depoliticisation. This is facilitated by the ambiguity of the boundary object and choreographed participation. The international influence of the blue economy and the dominant economic paradigm it represents, combined with social power relations, have shut down discussion and participation. This combination of structural and social power relations has led to an impasse in terms of where the blue economy *should* go: a lack of a shared vision. The question is where resistance, or counter-hegemony, could come from. In Gramscian terms, structural changes in world-order, and therefore challenges of hegemony, are always rooted in social relations in national societies and political orders (Gramsci 1971). This means that establishing counter-hegemony against the blue economy can only happen through the alliance of those that are disadvantaged by it (Cox 1983). Civil society has been identified as an important place where resistance and counter-hegemony can be

formulated and advocated (Pratt 2004). But the tendency to expand the state to include international civil society at the cost of local civil society (Cox 1983), reduces opportunities for meaningful engagement in the blue economy. In Seychelles specifically, civil society associations were long prohibited (Baker 2008), and an interviewee mentioned that still, "civil society is not strong enough; they do not realise their potential."[17]

The lack of strong voices coming from local civil society feeds into a lack of meaningful engagement of the blue economy with resource users. This lack of engagement means that the problematic configuration of oceans as placeless frontiers where economy and environment can coexist, cannot be effectively challenged by resource users. Meanwhile, Seychelles speaks with one voice on the blue economy in international settings, obscuring tensions between diverse interests locally. During the interviews, respondents spoke about "policy incongruencies in the country, where you have a national company actively licensing, and encouraging, exploration of oil and gas, and a trust fund that has been established to look at the adaptation and conservation."[18] This indicates the contradictions that come to the fore at the national level, such as the co-existence of oil, gas, and seabed mining with environmental aims.

The emergence of counter-hegemony in Seychelles is therefore constrained by a perceived need to align with hegemonic ideology, and the not yet realised potential of local civil society. However, if hegemony spreads from within national societies, counter-hegemony can also develop elsewhere and challenge world-order (Cox 1983). Indeed, counter-hegemonic currents are rising elsewhere, most notably in South Africa, where the negative consequences of blue economy-inspired growth have been argued to be felt acutely by small scale fishers, who are trapped between uneven economic development and competing conservation interests (Isaacs 2019). In this context, the movement for 'blue justice' has emerged (Too Big to Ignore 2018), which points at contradictions in the blue economy concept that often result in marginalisation of small-scale fisheries. Blue justice advocates

[17] NGO representative
[18] Government representative

for the recognition of small-scale fishers' rights to access, participation and equity in the blue economy (Isaacs 2019).

By using relational power on the ground, displaying resistance and forming associations, local resource users can engage with "alternative institutions and intellectual resources (…) while resisting the pressures and temptations to relapse into the pursuit of incremental gains for subaltern groups within the bourgeois hegemony" (Cox 1983 p. 165). Within this context, international expansion of Too Big to Ignore's push for blue justice is helpful. However, because power in social relations and power in structures of hegemony are interlinked (Okereke et al. 2009), resistance at the local level should accompany international movements, to re-politicise decision making at home.

5.6 Conclusion

The blue economy has widely gained influence at the international stage, and ties in with the wider hegemonic ideology that shapes the capitalist world-order. It has become influential through persuasion and consent, using the boundary object status to facilitate communication but also to offer something to everyone. The triple bottom line promise creates an appealing sense of progressive change, benefiting the economic, environmental, and social dimension simultaneously. Interest in the blue economy is further fueled by framings of the ocean as underdeveloped and underexplored (Steinberg 2018; Satizábal et al. 2020), and in need of rational management. The blue modernisation narrative thus absorbs issues associated with the ocean economy (e.g. coral bleaching, pollution, overfishing). It avoids "challeng[ing] the factors causing our ecological ills" (Ewing 2017 pp. 142–143), constituting a passive revolution of continued and even accelerated exploitation (Cox 1983).

The emerging conceptualisations and proposed ways of governing oceans also determine who is considered to be connected to the ocean, and consequently, which stakeholders have a voice in blue economy debates. The lack of a culture of local civil society engagement and the ambiguity in the concept means that local engagement in Seychelles has proven difficult. Instead, voices from the international civil society have managed to gain positions of influence, as exemplified by TNC's

involvement in the MSP process and their legally stipulated right to nominate an ex officio Director for the SeyCCAT Board.

In Seychelles, the blue economy offers a way of finding common ground in an environment that is characterised by political tensions, as well as environmental and financial pressures. The MSP offers a techno-managerial solution, rather than a normative discussion (Blühdorn 2017). However, blue modernisation also means a choice for a profit and growth paradigm, and an obstacle to alternative approaches for environmental governance. The current approach in marine spatial planning in Seychelles' blue economy requires different ocean uses to be measured in commensurable terms, in order to derive optimal configurations of activities. In doing so the MSP as it currently stands avoids political discussions that would enrich democracy. This can mean that activities such as small-scale fisheries being overlooked or even discarded as something that people need to be 'developed out of', thereby marginalising these activities instead of recognising their valuable contributions for food security and employment (Cohen et al. 2019). In Seychelles, there is an intellectual weariness when it comes to discussing the blue economy with resource users. The concept enables current power relations to continue to exist and even to be entrenched: the participation of 'stakeholders' is choreographed, and the beneficiaries of innovative financing and public-private partnerships are not marginalised groups but the powerful elite.

However, this does not mean that resistance is absent: competing interpretations and critique on the concept have been found in Seychelles (Schutter & Hicks 2019). Nevertheless, from an outside perspective the critique appears to be expressed only in private. For counter-hegemony to truly emerge from Seychelles, resistance needs to find its way into public dissent. Open discussion about a shared vision for the blue economy requires the recognition of small-scale fishers' and other resource users' rights that is proposed in the blue justice movement (Too Big to Ignore 2018; Isaacs 2019). There is a need to unpack the term blue economy, to discuss what a shared vision would look like, and to find entry points for change.

For potential counter-hegemony to materialise, fundamental change is needed to re-politicise environmental decision-making. It also involves recognising the role of the blue economy as a smokescreen for the perpetuation of business as usual. It does so by maintaining ambiguity, and obscuring trade-offs by introducing red herrings that distract from increased dependence on international financial markets and continued exploitation and inequality.

Chapter 6. Discussion

Introduction

Reconciling competing interests is a key challenge for environmental governance, especially in marine ecosystems, which are exposed to increasing environmental and climatic impacts and high levels of human dependence (Barlow et al. 2018). Such anthropogenic pressures are threatening marine biodiversity levels (Hughes et al. 2017), potentially amplified by the increasing interest in oceans as a source of economic growth (OECD 2016; The Economist Group 2018). In addition, marine ecosystems often have multiple systems of rules that operate in parallel to one another, and sometimes are in conflict, which makes effective governance even more challenging (Bavinck & Gupta 2014). Marine ecosystems governance is therefore complex, requiring an interactive governance approach capable of aligning the values and principles of different governance actors so that conflicting interests can be resolved (Kooiman & Bavinck 2013).

Contemporary marine governance approaches, such as the blue economy, are characterised by efforts to integrate environmental, social, and economic interests, thereby seeking to achieve several objectives at once with the aim of generating triple wins. The blue economy has become a powerful influence in international and local policy discourse, particularly noticeable in Africa (Childs & Hicks 2019). However, for blue economy objectives be implemented successfully and equitably they must align with existing governing systems (Voyer et al. 2020). Seychelles has gained visibility and a voice at the international stage by associating itself with the blue economy early on. However, within Seychelles understandings of the blue economy are less coherent, leading to a decision-making vacuum in which the formation of a shared vision is impeded (Schutter & Hicks 2019; Chapter 5).

Where the blue economy aims to integrate diverse social, economic and environmental interests, ecosystem services seek to demonstrate the importance of biodiversity for human well-being by drawing on a diversity of disciplinary perspectives. However, the extent to which ecosystem services research represents a diversity of disciplinary perspectives is contested (Gómez-Baggethun et al.

2010). Ecosystem services can be thought of as operating at the site level, within the system-to-be-governed, whereas the blue economy is a powerful discourse in the governing system. Both approaches present the possibility of complementing each other to facilitate alignment between the system that is being governed and the governing system, and mediate their interactions. However, both have received considerable critique for a failure to reflect the diversity of values, worldviews, and images associated with resource governance and use, and instead drive a particular agenda. Despite critique, both ecosystem services and the blue economy are gaining considerable support and traction in marine governance, at national and international scales, and thus deserve analysis.

The aim of my thesis was therefore to develop an understanding of the extent to which the evolving landscape of marine environmental governance contributes to aligning the values, worldviews and images of the governing system with those of resource users. To achieve this, I examined the blue economy and ecosystem services using a diversity of methods, from different angles, and at different scales. This approach was aimed at assessing the ability of both concepts to engage with a variety of actors in principle (in research and policy discourse), and evaluating the shape these concepts take in practice. In the next subsection, I first summarise the conclusions from each chapter. I then explore cross-cutting themes that emerge from my thesis, and place both concepts in the wider literature and their role in interactive governance. I conclude with the limitations of my work and suggestions for future research directions.

Synthesis of thesis so far

Ecosystem services have often been critiqued for adopting an overly narrow focus on neoclassical economic methods and thinking. I therefore set out Chapter 2, to evaluate this critique and assess the extent of interdisciplinarity engagement in ecosystem services research. I used a quantitative bibliometric approach, combined with network analysis, to measure the degree with which an article's citations draw on perspectives from across disciplinary boundaries. I found that research on ecosystem services has grown exponentially since the 1980s, and that there is an increasing number of disciplines involved. This increase is also reflected in the growing number of social science

disciplines that publish on ecosystem services. However, the proportion of social science involvement has remained stable over the years, and ecology-based disciplines remain the most influential in the field. Interestingly, economics appeared to play a relatively minor role in the growth of the field. Nevertheless, the growth of social science involvement in ecosystem services research points at potential for the inclusion of heterogeneous knowledge and plural worldviews. This could help the concept to return to its goal of connecting ecological functioning with human well-being, thereby raising support for conservation.

Ecosystem service research informs the governing system and tends to apply the concept at the site level, focused on species, ecosystems, or resource users. Ecosystem services approaches are often used to understand the preferences people attach to these systems. Such assessments are thought to be capable of capturing plural values (Harrison et al. 2018) and used to develop support for conservation, or guide decision making. However, how values and preferences relate remains unclear. I therefore applied the ecosystem services concept to a resource user-setting in Chapter 3. I elicited information on people's values and preferences in order to explore how well preferences capture people's underlying values. I used the portrait values questionnaire to establish people's values, a quantitative ranking exercise to establish preferences, and a qualitative approach to explore the values underpinning those preferences. Seychelles was characterized by strong self-transcendence values, and resource users, unsurprisingly, had strong preferences for fishery services. I found preferences and values were not aligned, to such an extent that some of the most important preferences (e.g. fishery) were associated with the least important values (self-enhancement). However, the reasons that people gave for their preferences, were more aligned with the general values structure that I found in Seychelles, which prioritises self-transcendence values over self-enhancement. In future, ecosystem service assessments that directly ask people to explain their preferences would give better insight into the reasons for why they ranked the services the way they did. This chapter identified a need for the explicit deliberation of values in environmental governance, in order to align the realities of the system that is being governed with the institutions of the governing system, but also with their underlying values, worldviews, images and principles.

The blue economy is one of the most dominant current manifestations on ecosystem services in contemporary marine governance. With the blue economy gaining considerable traction and influence, perspectives on the blue economy have been analysed on the international stage, however analyses at the national scale, where the blue economy is being implemented are lacking. In Chapter 4, I therefore explored perspectives on the blue economy amongst those holding formal decision-making roles within the Seychelles governing system. My aim was to examine the extent to which international discourse and critique around the blue economy is reflected in Seychelles. Through using Q-methodology and interviews I found three perspectives on the blue economy in Seychelles: *supportive* in principle, *critical* in practice; *pragmatic and accepting*; or *idealistic*. These perspectives reflect some of the international critique on the concept, for instance doubts around the reconciliation of environmental and economic interests. However, much of international discourse was not reflected in the perspectives in Seychelles, and there was very limited attention for the social dimension of the blue economy. Social concerns were only expressed by one of the actors, and was found to be of very low influence in the network of actors involved in the blue economy.

The blue economy is largely presented as an apolitical, technical process, promoted most vigorously by institutions and agencies with considerable economic power and influence (e.g. The World Bank, OECD). In Chapter 5, I therefore explore how power manifests within Seychelles as a part of the increasingly dominant international blue economy narrative. My aim was to examine the causes and consequences of the continued influence of the blue economy concept, through exploring the power of the blue economy in international discourse and how this is translated into national policy negotiations. I found that internationally, the blue economy is maintained as influential through persuasion and the creation of a 'common sense', presenting the possibility of triple wins through rational management. On the ground, despite the sense that there are critical voices, as Seychelles is shaping the blue economy (Chapter 4), outward discussion is stifled by depoliticised decision-making processes, leading to simmering discontent that is only expressed in private. The internationally hegemonic status of the blue economy concept persists locally.

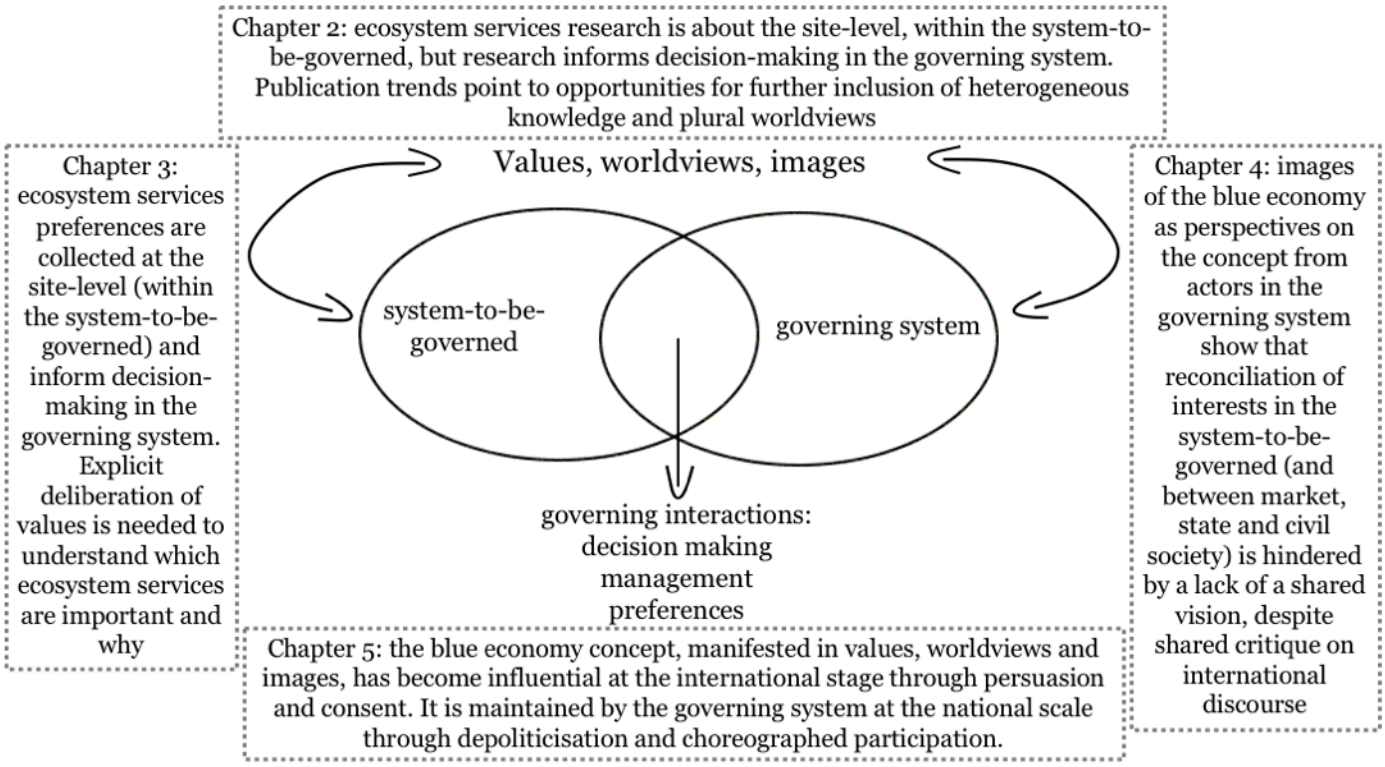

Figure 6.1 Thesis findings per chapter and their relation to the interactive governance framework. Ecosystem services operate at the site level, within the system-to-be-governed, but the concept is mainly used within the governing system. The blue economy contributes to the wider discourse in the governing system, both at an international scale and a national scale, in which ecosystem services are used for marine environmental management and decision-making. Thereby, ecosystem services and the blue economy offer the promise of complementing each other to facilitate alignment between the system that is being governed and the governing system, and mediate their interactions to deliberate on values, worldviews and images underpinning environmental governance. However, explicit discussion and interaction between governance scales is lacking.

Emerging themes and challenges

Deliberation on values, worldviews and images

Values convey ideas about what is important and how things ought to be. An understanding of values was therefore central to chapters 2, 3, and 4, in how values relate to, and underpin,

worldviews, images, and preferences. Interactive governance theory pays explicit attention to the values that underpin the system-to-be-governed, the governing system, and their interactions, for values form the foundation of decision-making and shape the interactions that take place (Kooiman & Jentoft 2009). Values, as the "normative and ethical cornerstones" of environmental governance (Kooiman & Jentoft 2005 p. 298), should be widely deliberated in society, engaging all those involved in governing interactions (Kooiman & Jentoft 2009). In my third chapter, I unpacked the values that underlie resource users' ecosystem services preferences, and I argue for explicit recognition of these values, as preferences do not always offer adequate insight into *why* people care about ecosystem services. Therefore, collecting preferences alone obscures values that might not be recognised without adequate processes of deliberation. A lack of attention for resource users' values is problematic considering the foundational role that values play in the development of worldviews and images that play a role in environmental governance.

Worldviews and images operate as a translation of underlying values and epistemologies into preferred governance mechanisms (Sowman 2015). The knowledge and worldviews available in ecosystem services research point to a narrow ecology-focused approach, in which Ecology continues to dominate knowledge production and social sciences are slow to catch up. This limits opportunities for truly integrating the diverse dimensions that the concept seeks to cover in order to connect human well-being to ecological functioning. More engagement is needed to create space for a variety of knowledges and worldviews to be included in ecosystem services.

Images, as perspectives on the blue economy, were the focus of Chapter 4. When it comes to implementing the blue economy, Seychelles' policy makers that operate in the governing system expressed perspectives that did not fully reflect international discourse, indicating a desire to further shape and steer the concept locally. However, respondents' images of the blue economy maintained a focus on trade-offs between the economic dimension and the environmental dimension, and social concerns were rarely expressed. The way that policy makers in Seychelles see a powerful discourse

such as the blue economy can create a powerful image of the ocean as the system-to-be-governed, leading to ideas on how it should be governed, thus shaping reality (Song et al. 2013).

Power as mediated by boundary objects

Explicit deliberation and negotiation of values, images and principles has been argued to be a way of mediating power relations that may dominate interactions between and within different governance orders (Song et al. 2013). Addressing these power relations is essential, since mismatches between values or a lack of shared values between those in the governing system and those in the system-to-be-governed have been shown to impact the poor and marginalised communities disproportionately (Sowman 2015). The prevailing arrangement of values, images and principles will shape policy decisions and approaches. However, when there are discrepancies between e.g. values and images, powerful images at the highest level of decision-making may override common values shared by the population (Song et al. 2013). The blue economy and ecosystem services are examples of potentially powerful images. In my thesis, I identified multiple ways in which power played a role in the discussion of values, worldviews and images. I found power to be mediated by boundary objects, which offer a common platform for diverse stakeholders, but can also result in images that are powerful enough to shut down discussion and obscure trade-offs.

Boundary objects play a role in many areas of environmental governance, providing a platform for collaboration between diverse stakeholders, and often aiming to integrate environmental concerns into the economy (Åkerman 2005; Brand & Jax 2007; Abson et al. 2014; Garmendia et al. 2016). However, boundary objects can also stifle discussion: through their plasticity, boundary objects may appear 'apolitical' and obscure incompatible interpretations (Christiansen & Schutter 2019). Ecosystem services' status as a boundary object has managed to attract the attention of a variety of different disciplines, but this appeal has also allowed for the dominance of Ecology over other disciplines, including social sciences. This dominance limits opportunities for truly integrating the diverse dimensions that the concept seeks to cover in order to connect human well-being to ecological functioning. The blue economy has acted as a boundary object as well, obtaining power from the

support of hegemonic states. Other states have recognised in the blue economy opportunities for recognition and visibility on an international stage and have therefore enthusiastically embraced the concept. The powerful status and associated opportunities of the blue economy makes it important for states to be associated with, which can explain the continued engagement with the term.

Building on their status as boundary objects, power is also derived from the framing of ecosystem services and the blue economy as rational approaches of optimising environmental governance. The integration of human and environmental needs serves to neutralise and absorb challenges to the 'development as economic growth' paradigm by repackaging them as triple win opportunities (Wanner 2015). Thereby, both concepts attract broad interest and offer a 'common sense' solution, whilst also ensuring broad support. As a result, power is established by persuasion and discussion is shut down, benefitting currently hegemonic interests.

Depoliticisation and dissent

The boundary object status of the blue economy is thus used to depoliticise discussions, thereby implicitly aligning with the current hegemonic capitalist paradigm. As a result of the process of establishing hegemonic ideology, the blue economy has been argued to only increase pressures on marine ecosystems, through increased extraction needs of capital accumulation strategies (Bond 2019; Mallin & Barbesgaard 2020). Amidst this scramble for ocean space, Marine Spatial Planning (MSP) in Seychelles could serve to truly engage with the use and preferences of stakeholders for ecosystem services and their underlying values. However, the democratising potential of MSP has not yet materialised in Seychelles. This is due to the post-political manner in which MSP is implemented, where it is presented as an impartial and rational process (Flannery & McAteer 2020), leading to the choreographed participation that emerged as an important theme in interviews. A depoliticised MSP process may create the illusion that 'technical fixes' are possible, which further decreases the possibilities for resolving issues that are really about conflicting values, worldviews and images (Song et al. 2013). Although a focus on the technical helps to navigate historical tensions and a lack of trust, it does nothing to address conflicts in values and images between the system-to-be-governed and the

governing system. In order to realise the democratising potential of MSP, environmental governance needs to be re-politicised, to explicitly discuss values instead of focusing on techno-managerial approaches that favour the worldviews of a powerful elite. Indeed, direct and explicit attention to the values and the image of the 'sea as a frontier' has been identified as essential for exposing problematic conceptualisations of oceans, which lead not only to decreased ecosystem health but also might be at odds with the views of resource users (Song et al. 2013).

Re-politicising environmental governance could allow for the private dissent that is present to become more public. Observations from the broader governance landscape in Seychelles indicate that critical voices do not yet 'trickle up'. Governance actors were able to share more critical views during the (private) interviews than they felt they could in official interactions with others, for example in the MSP process. Dissent is also present in relation to the ecosystem services concept. In Chapter 2 I found that although social science involvement in research is stagnating, these disciplines do engage with the concept. They might even be strengthening from within, through mainly citing other social sciences in the field, thereby preserving integrity for the role of social sciences in ecosystem services research. As their engagement grows, these disciplines might be carving out a larger role for themselves, countering the dominant role of ecology-based disciplines and offering potential for the wider inclusion of plural worldviews.

Future directions and caveats

Ecosystem services and the blue economy are thought to offer potential for the alignment of different interests through their emphasis on multiple and interlinked goals for environmental governance. Whilst the blue economy informs wider policy discourse, ecosystem services can be seen as the materialisation of this discourse through capturing preferences and values on the ground. However, the bold aims of both concepts have also attracted awareness of where they might be failing. This awareness is demonstrated by simmering dissent on the ground, but also by academic critique, arguing for instance that rhetoric around participation and inclusion is in fact masking increased precarity for workers in the green/blue economy and ecosystem services sectors (Neimark et al.

2020). In addition, it is argued that the current emphasis on economic gains in the blue economy in Africa should be replaced with a full-spectrum view of sustainability, building on a more balanced set of ecological, economic, socio-cultural and institutional objectives and involving local communities (Okafor-Yarwood et al. 2020).

Further exploring the role of values in prioritising ecosystem services would contribute to wider and more inclusive deliberation. The inclusion of plural values in ecosystem-services inspired decision-making has been argued to contribute to more equitable and sustainable outcomes, providing space for marginalised stakeholders (Zafra-Calvo et al. 2020). Engaging marginalised communities is especially important considering the uneven impact that mismatches in values have in these communities (Sowman 2015). In addition, it has been proposed that future sustainability transformations will be more likely to be successful when values in the context of caring for nature are more clearly discussed (Bieling et al. 2020).

Through its place within the hegemony of capitalism, the blue economy has been heralded as a rational, common-sense approach to integrated ocean governance. The triple-win aim and support from powerful actors has persuaded many to associate themselves with it. The blue economy is likely to continue to be influential: after Seychelles and other small island states have pioneered the concept, there is now increasing interest from a variety of states, but also from (global) civil society and private actors (Childs & Hicks 2019; Satizábal et al. 2020). International NGO The Nature Conservancy has expressed interest in replicating the debt-for-nature swap that they brokered and pioneered in partnership with Seychelles, aiming to roll out deals in 20 countries in the next 5 years (Evans 2020). However, articulating a shared vision on the blue economy remains a challenge, also in different geographical locations such as the Caribbean, where a lack of understanding on the blue economy has led to a decision-making impasse (Hassanali 2020).

In Seychelles there is simmering dissent on the ground, as I found in Chapter 4. Although for the reasons discussed above, this dissent is slow to 'trickle up', outside of Seychelles there is rising

counter-hegemony in the shape of blue justice, which is advocating for the recognition and inclusion in decision making of small scale fishers (Too Big to Ignore 2018; Isaacs 2019). Thus, blue justice could contribute to deliberation on powerful values and images, which would address uneven power relations that not only lead to procedural gaps, but also have been shown to lead to disproportionate impacts on poor and marginalised communities (O'Neill 2007; Song et al. 2013; Sowman 2015). As discussed in Chapter 5, counter-hegemony that emerges elsewhere can contribute to challenging the hegemonic world-order by spreading to other national societies (Cox 1983). Indeed, during later visits to Seychelles, the social dimension of the blue economy received more attention than before.

My thesis has several limitations that could be built upon in future work. Firstly, the choice to assess interdisciplinarity in ecosystem services research through citations between journal disciplines disregards content and relies heavily on the Clarivate classification method. Although this allows for the analysis of a large volume of publications, it is not possible to review the precise values or worldviews advanced by these papers. Future work could contribute to examining the link between disciplines and values and images advanced by those disciplines.

Second, using an ecosystem services framework in assessing people's preferences is likely to have influenced the subsequent motivations of their choices. Respondents were asked to indicate their personal preferences, with an emphasis on the importance of each service *for them*. Thereby, the preferences elicited are likely to be individually motivated, which has shaped the underlying values that respondents expressed as a reason for their rankings. In addition, my approach has only focused on the human preferences aspect of ecosystem service. Ecological pressures are likely to influence the extent to which people can enjoy ecosystem services, and they might even introduce novel ecosystem services (Woodhead et al. 2019), but this was outside of the scope of this thesis.

Third, my thesis has focused on resource users' values directly, interpreting these in the wider context of blue economy values and images. However, despite a consistent values structure found between residents, tourism operators and fishers, it is unclear to what extent those in the governing system

have similar values too. Further research is needed into the values, principles and images of those in the governing system more directly. The determination and allocation of values according to which decisions are made and evaluated is a process full of power dynamics, and since decision-making is not evenly distributed, explicit consideration of the values of those at the highest level is necessary (Song et al. 2013; Kooiman & Jentoft 2009).

Fourth, the implementation of blue economy policies is likely to look very different in other national contexts than Seychelles. Geographical, cultural and political characteristics are likely to play a role, as well as the dynamics between countries that are looking to implement the concept in a shared region (Hassanali 2020). It is therefore necessary to study each implementation of the blue economy on a case-by-case basis, as even the dominant international discourse might be felt differently in other countries.

Finally, my positionality and the political situation in Seychelles have certainly affected the results found. Seychelles' unique character has meant that it was an accessible place to do research, and I was able to quickly connect to a wide range of resource users, decision-makers and high-level diplomats. The friendly attitude of my respondents meant that I was able to build rapport with them. This has inevitably influenced what was shared with me in interviews, and I found that dissent with the blue economy discourse was easier expressed under anonymity than in public. However, more recent economic and political changes have meant an increase in tensions around the blue economy as it has become a topic of debate for the elections that are planned for October 2020.

Conclusions

The question that my thesis asked was to what extent ecosystem services and the blue economy succeed in demonstrating the importance of biodiversity whilst integrating diverse social, economic, and environmental interests, allowing for the interaction of different elements of society. I found that the success of these concepts in achieving alignment between the system-to-be-governed and the

governing system is hindered by a lack of discussion on values. This is facilitated by the configurations of power and processes of depoliticisation. However, dissent is present and emerging.

The blue economy and ecosystem services concepts have grown to be influential currents in environmental governance. The strength and appeal of both concepts is the integration of several objectives at once, and their status as boundary objects has offered the opportunity for diverse actors to coalesce. The aim of my thesis was to assess how these concepts contribute to interactive environmental governance. I set out to address this aim throughout my four chapters, covering ecosystem services research and practice, and international and national blue economy perspectives and negotiations. I found that although ecosystem services aim to connect human and ecological well-being, social science involvement has been slow to develop and practical applications of the concept obscure underlying values. Thereby, the representation of these values in the governing system and the meta-governance order is lacking. In the blue economy, similar issues arise. Due to the powerful international discourse and the persuasive appeal of associating with hegemonic interests, there is a perceived need to make the blue economy happen on the ground as well. The weight of the blue economy at the international stage, combined with a lack of trust and the depoliticisation that a boundary object offers, lead to a lack of deliberation on a vision for the blue economy, let alone an explicit discussion about values.

The multiple and increasing pressures on and demands from marine ecosystems require interactive governance that reconciles the various interests through deliberation on underlying values, principles, worldviews and images. Comparing people's attitudes towards these underlying aspects of governance also opens up processes of power, giving insight into whose values count, and which images are leading governance visions. Concepts that seek to reconcile competing interests by integrating and optimising their demands offer potential, but need to be applied with explicit recognition of power relations and conflicting values.

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Appendices

A.1 Q-method statements

1. With the blue economy concept and the debt-for-nature swap, Seychelles is running away from debt, rather than moving towards better protection of the oceans
2. When it comes to promoting behavioural change, we shoukd be tapping into the intrinsic values that people hold for nature, rather than purely economic values
3. It is wrong to have financial reasons for environmental protection, as within the Marine Spatial Plan resulting from a debt-for-nature swap
4. In the Seychelles' blue economy, protection and recovery of ocean ecosystems and biodiversity are a priority
5. The preservation of our unique and pristine marine environment is core to the transition to a blue economy
6. The blue economy has helped Seychelles establish the national identity. It is the Seychellois way of managing the environment
7. The blue economy should give more recognition to fishers, in correspondence with their importance for the economy of Seychelles
8. The blue economy fails to take into account the cultural importance of fisheries in Seychelles
9. Financing conservation with money from abroad means a loss of sovereignty
10. Seychellois are well placed to be the greatest of activists for the blue economy
11. The economic growth afforded by hydrocarbon (oil and gas) exploration and mariculture can be used to advance sustainable development while meeting environmental challenges created through such activities
12. The environment should be mainstreamed more into the economy and general policy making
13. Moving into a market economy and fostering entrepreneurship will make the blue economy successful

14. Marine conservation is a hard sell. The only way to sell it is through development.
15. By expressing the importance of nature in economic terms, people will think more about the consequences of acting upon nature
16. Sustainable development is the new generation of conservation
17. The best way to do conservation is to work together with the different economic sectors and try to get closer with the fisheries and tourism industry
18. The goal of the blue economy is to make sure the ocean is utilised for the economy
19. The open market economy gives the public an opportunity to become stakeholders and thereby be involved in blue economy initiatives
20. The blue economy makes optimal use of the untapped potential of enhanced exploration, and sustainable exploitation, of our oceanic spaces
21. The blue economy does not have enough attention for the effects of its policies on livelihoods
22. The blue economy and related initiatives are helping stakeholders to get their voices heard
23. Conservation is good, but we need to keep on the lookout in case the plans become tools to keep fishers away or it turns into land grabbing, like has happened in many other places
24. The blue economy is trying to do too many things at the same time: it is about conservation, but also includes things that are in conflict with conservation
25. Money is often dictating blue economy policies
26. Local communities are not represented enough in the blue economy
27. Fishers have an disproportionately large voice in the blue economy, compared to their economic contribution
28. The blue economy is fundamentally about social inclusion
29. The blue economy just gives a different name to what is "business-as-usual"
30. The blue economy is good PR - it has put Seychelles on the international agenda. But it does not really make a difference

31. The blue economy banner is a leverage tool for Seychelles in international fora. It gives Seychelles a disproportionally large voice and works well for receiving funding
32. The blue economy can provide some much-needed coordination between different organisations and stakeholders related to the environment

A.2 Online questionnaire for actors in positions of formal decision-making

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Start of Block: Introduction

Welcome
Welcome to the questionnaire

I am a PhD student at Lancaster University and I would like to invite you to take part in a research study about policy making for natural resource management and conservation. Thank you very much for your consideration to participate and help me with my study.

In this questionnaire, I am interested in the part of your work that has to do with the Seychelles Marine Spatial Plan (MSP) and the blue economy. I am interested in your work for the MSP and the blue economy, or the part of your work that is perhaps affected by the MSP and the blue economy. In his State of the Nation Address on 26 February 2015, President James Alix Michel of Seychelles announced a debt restructuring deal between the Seychelles and some of its creditors, involving a debt buyback worth US$21.6 million. The debt restructuring deal between the Seychelles government, the Paris Club and TNC has also been called a "debt-for-adaptation swap" (Seychelles Government 2017; The Nature Conservancy 2017) and a "debt-for-nature swap". These names refer to the fact that one of the conditions of the deal was that the Seychelles government would agree to protect 30% of the Exclusive Economic Zone. The Marine Spatial Plan (MSP) is designed to define the exact locations for the protected areas, which – as agreed in the debt swap deal – will constitute 30% of Seychelles' EEZ. In this questionnaire, I would like to ask you about the organisations you work with in the context of the MSP and the blue economy background.

Participant information

Please take time to read the following information carefully before you decide whether or not you wish to take part.

What is the study about?
This study aims to find out who are the people and organisations involved in natural resource management and conservation in the Seychelles, and how they are connected.

Why have I been invited?
I have approached you because you work for one of the organisations that are mentioned as stakeholders in the Marine Spatial Plan in Seychelles, or because you have been mentioned by one of the other participants as being part of their network. I would be very grateful if you would agree to take part in this study.

What will I be asked to do if I take part?
If you decided to take part, this would involve the following: I have a questionnaire with 6 questions about the people and the organisations you work with both inside and outside Seychelles. I would like to ask you to fill out an online questionnaire, which should last a maximum of 10 minutes.

What are the possible benefits from taking part?

Taking part in this study will allow you to share your experiences of working in natural resource management and conservation in the Seychelles and thereby contribute to our understanding of the different actors involved in this field.

Do I have to take part?
No. It's completely up to you to decide whether or not you take part. Your participation is voluntary and you are free to withdraw at any time during the questionnaire, without giving any reason.

What if I change my mind?
You are free to withdraw at any time during the questionnaire, in which case no data will not be recorded. Data means the information, views, ideas, etc. that you and other participants will have shared with me. However, it is impossible to take out data from one specific participant when this has been recorded, because your participation is anonymous. Therefore, you can only withdraw when you have not yet finished the questionnaire.

What are the possible disadvantages and risks of taking part?
There are no major disadvantages to taking part, except from the time investment of approximately 10 minutes.

Will my data be identifiable?
After the interview, only I, the researcher conducting this study, and my supervisor, Dr Christina Hicks, will have access to the data you share with me. This questionnaire records no personal information about you (e.g. it does not record your name or other information about you that can identify you)

How will my data be stored?
Your data will be stored in encrypted files (that is no-one other than me, the researcher will be able to access them) and on password-protected computers. In accordance with University guidelines, I will keep the data securely for a minimum of ten years, after which it will be permanently destroyed.

How will we use the information you have shared with us and what will happen to the results of the research study?
I will use the data you have shared with only in the following ways:
I will use it for academic purposes only. This will include my PhD thesis and journal articles. I may also present the results of my study at academic conferences or inform policy-makers about my study.

Who has reviewed the project?
This study has been reviewed and approved by the Faculty of Science and Technology Research Ethics Committee.

What if I have a question or concern?
If you have any queries or if you are unhappy with anything that happens concerning your participation in the study, please contact myself:

Marleen Schutter, PhD Student
A54 - LEC 3 | Lancaster Environment Centre
Lancaster University

Lancaster - LA1 4YQ
United Kingdom
Tel: +44 (0) 7397319300

or my supervisor:

Christina Hicks, PhD
Lancaster Environment Centre
Lancaster University
LA1 4YW, UK
Tel +44 (0)1524595089

If you have any concerns or complaints that you wish to discuss with a person who is not directly involved in the research, you can also contact:

Professor Philip Barker
Lancaster Environment Centre Director
Lancaster Environment Centre
Lancaster University
LA1 4YW, UK
Tel: +44 (0)1524 510262

Thank you for considering your participation in this project. This is of great help for my research!

Consent
Before starting the questionnaire, I would like to ask you if you agree with the following statements:

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
2. I understand that my participation is voluntary and that I am free to withdraw at any time during the completion of the questionnaire, without giving any reason, by closing the window of the internet browser.
3. I understand that any information given by me may be used in future reports, academic articles, publications or presentations by the researcher/s, but my personal information will not be included and I will not be identifiable.
4. I understand that my name/my organisation's name will not appear in any reports, articles or presentation without my consent.
5. I understand that any data will be protected on encrypted devices and kept secure.
6. I understand that data will be kept according to University guidelines for a minimum of 10 years

after the end of the study.
7. I agree to take part in the above study.

- ○ Yes, proceed to questionnaire (4)
- ○ No (5)

End of Block: Introduction

Start of Block: Own organisation

Background question Which of these organisations do you work for? More than one answer is possible.

- [ ] Seychelles Conservation and Climate Change Adaptation Trust (SeyCCAT) (1)
- [ ] The Nature Conservancy (TNC) (2)
- [ ] United Nations Development Program (UNDP) (3)
- [ ] Global Environmental Facility (GEF) Programme Coordination Unit (4)
- [ ] Department of Blue Economy (5)
- [ ] Ministry of Environment, Energy and Climate Change (MEEC) (6)
- [ ] Department of Environment (7)
- [ ] Seychelles National Parks Authority (SNPA) (8)
- [ ] Ministry of Agriculture and Fisheries (9)
- [ ] Seychelles Fishing Authority (SFA) (10)
- [ ] Ministry of Land Use and Habitat (11)
- [ ] Marine Conservation Society Seychelles (MCSS) (12)
- [ ] Fishing Boat Owners Association (FBOA) (13)
- [ ] Island Conservation Society (ICS) (14)
- [ ] Seychelles Island Foundation (SIF) (15)
- [ ] PetroSeychelles (16)
- [ ] SWIOFish3 (17)

- [ ] The Nature Conservancy (TNC) International (23)
- [ ] The World Bank (24)
- [ ] Food and Agricultural Organisation (FAO) (25)
- [ ] Global Environmental Facility (GEF) (29)
- [ ] United Nations Development Programme (UNDP) (30)
- [ ] European Union (EU) (31)
- [ ] Environmental Defense Fund (32)
- [ ] WorldFish (33)
- [ ] United Nations (38)
- [ ] Ocean Conservancy (34)
- [ ] Other, please specify: (19) _____
- [ ] Other, please specify: (18) _____
- [ ] Other, please specify: (20) _____

End of Block: Own organisation

Start of Block: Information sharing with organisations in Seychelles

Intro Block 1 Part 1 of the questionnaire is about your relationship with other **organisations in Seychelles**. There are 3 subjects in this part: information sharing, resources sharing and direction giving/receiving.

Intro1 In this section I am interested in **information** *(Examples: information about new opportunities, relevant science, and stakeholders)* you share with organisations in Seychelles for your work on

achieving the vision, goals and objectives of the Marine Spatial Plan and the blue economy in Seychelles, or for the part of your work that is affected by the Marine Spatial Plan and the blue economy.

Q1 Which of these organisations do you share **information** with **in Seychelles?** Multiple answers possible.

- ☐ Seychelles Conservation and Climate Change Adaptation Trust (SeyCCAT) (1)
- ☐ The Nature Conservancy (TNC) (2)
- ☐ United Nations Development Program (UNDP) (3)
- ☐ Global Environmental Facility (GEF) Programme Coordination Unit (4)
- ☐ Department of Blue Economy (5)
- ☐ Ministry of Environment, Energy and Climate Change (MEEC) (6)
- ☐ Department of Environment (7)
- ☐ Seychelles National Parks Authority (SNPA) (8)
- ☐ Ministry of Agriculture and Fisheries (9)
- ☐ Seychelles Fishing Authority (SFA) (10)
- ☐ Ministry of Land Use and Habitat (11)
- ☐ Marine Conservation Society Seychelles (MCSS) (12)
- ☐ Fishing Boat Owners Association (FBOA) (13)
- ☐ Island Conservation Society (ICS) (14)
- ☐ Seychelles Island Foundation (SIF) (15)
- ☐ PetroSeychelles (16)

	Do you receive information from this organisation, or do you provide the organisation with information?		What is the frequency with which you share information?				How influential is the information that you share in enabling you to do your work?		
	I receive information (1)	I provide information (2)	Daily (1)	Weekly (2)	Monthly (3)	Ad hoc (4)	Low influence (1)	Medium influence (2)	High influence (3)
Seychelles Conservation and Climate Change Adaptation Trust (SeyCCAT) (x1)	☐	☐	○	○	○	○	○	○	○
The Nature Conservancy (TNC) (x2)	☐	☐	○	○	○	○	○	○	○
United Nations Development Program (UNDP) (x3)	☐	☐	○	○	○	○	○	○	○
Global Environmental Facility (GEF) Programme Coordination Unit (x4)	☐	☐	○	○	○	○	○	○	○
Department of Blue Economy (x5)	☐	☐	○	○	○	○	○	○	○
Ministry of Environment, Energy and Climate Change (MEEC) (x6)	☐	☐	○	○	○	○	○	○	○
Department of Environment (x7)	☐	☐	○	○	○	○	○	○	○

Seychelles National Parks Authority (SNPA) (x8)	☐	☐	○	○	○	○	○	○	○
Ministry of Agriculture and Fisheries (x9)	☐	☐	○	○	○	○	○	○	○
Seychelles Fishing Authority (SFA) (x10)	☐	☐	○	○	○	○	○	○	○
Ministry of Land Use and Habitat (x11)	☐	☐	○	○	○	○	○	○	○
Marine Conservation Society Seychelles (MCSS) (x12)	☐	☐	○	○	○	○	○	○	○
Fishing Boat Owners Association (FBOA) (x13)	☐	☐	○	○	○	○	○	○	○
Island Conservation Society (ICS) (x14)	☐	☐	○	○	○	○	○	○	○
Seychelles Island Foundation (SIF) (x15)	☐	☐	○	○	○	○	○	○	○
PetroSeychelles (x16)	☐	☐	○	○	○	○	○	○	○
SWIOFish3 (x17)	☐	☐	○	○	○	○	○	○	○
Other, please specify: (x20)	☐	☐	○	○	○	○	○	○	○

Other, please specify: (x19)	☐	☐	○	○	○	○	○	○	○
Other, please specify: (x18)	☐	☐	○	○	○	○	○	○	○

☐ SWIOFish3 (17)

☐ Other, please specify: (20) _____

☐ Other, please specify: (19) _____

☐ Other, please specify: (18) _____

Carry Forward Selected Choices from "Which of these organisations do you share information with in Seychelles? Multiple answers possible."

Q2 Could you tell me a bit more about your information sharing with these organisations within Seychelles? *(Examples of information are: information about new opportunities, relevant science, and stakeholders)*

End of Block: Information sharing with organisations in Seychelles

Start of Block: Resources sharing with organisations in Seychelles

Intro2 In this section I am interested in resources *(Examples: staff, time, and equipment)* you share with organisations in Seychelles for your work on achieving the vision, goals and objectives of the Marine Spatial Plan and the blue economy in Seychelles, or for the part of your work that is affected by the Marine Spatial Plan and the blue economy.

Q3 Which of these organisations do you share resources with in Seychelles? Multiple answers possible.

- [ ] Seychelles Conservation and Climate Change Adaptation Trust (SeyCCAT) (1)
- [ ] The Nature Conservancy (TNC) (2)
- [ ] United Nations Development Program (UNDP) (3)
- [ ] Global Environmental Facility (GEF) Programme Coordination Unit (4)
- [ ] Department of Blue Economy (5)
- [ ] Ministry of Environment, Energy and Climate Change (MEEC) (6)
- [ ] Department of Environment (7)
- [ ] Seychelles National Parks Authority (SNPA) (8)
- [ ] Ministry of Agriculture and Fisheries (9)
- [ ] Seychelles Fishing Authority (SFA) (10)
- [ ] Ministry of Land Use and Habitat (11)
- [ ] Marine Conservation Society Seychelles (MCSS) (12)
- [ ] Fishing Boat Owners Association (FBOA) (13)
- [ ] Island Conservation Society (ICS) (14)
- [ ] Seychelles Island Foundation (SIF) (15)
- [ ] PetroSeychelles (16)
- [ ] SWIOFish3 (17)

☐ Other, please specify: (20) _____

☐ Other, please specify: (19) _____

☐ Other, please specify: (18) _____

Carry Forward Selected Choices from "Which of these organisations do you share resources with in Seychelles? Multiple answers possible."

Q4 Could you tell me a bit more about your resources sharing with these organisations within Seychelles? (Examples of resources: information about new opportunities, relevant science, and stakeholders)

	Do you receive resources from this organisation, or do you provide the organisation with resources?		What is the frequency with which you share resources?				How influential are the resources that you share in enabling you to do your work?		
	I receive information (1)	I provide information (2)	Daily (1)	Weekly (2)	Monthly (3)	Adhoc (4)	Low influence (1)	Medium influence (2)	High influence (3)

Seychelles Conservation and Climate Change Adaptation Trust (SeyCCAT) (x1)	☐	☐	○	○	○	○	○	○
The Nature Conservancy (TNC) (x2)	☐	☐	○	○	○	○	○	○
United Nations Development Program (UNDP) (x3)	☐	☐	○	○	○	○	○	○
Global Environmental Facility (GEF) Programme Coordination Unit (x4)	☐	☐	○	○	○	○	○	○
Department of Blue Economy (x5)	☐	☐	○	○	○	○	○	○
Ministry of Environment, Energy and Climate Change (MEEC) (x6)	☐	☐	○	○	○	○	○	○
Department of Environment (x7)	☐	☐	○	○	○	○	○	○
Seychelles National Parks Authority (SNPA) (x8)	☐	☐	○	○	○	○	○	○

Ministry of Agriculture and Fisheries (x9)	☐	☐	○	○	○	○	○	○
Seychelles Fishing Authority (SFA) (x10)	☐	☐	○	○	○	○	○	○
Ministry of Land Use and Habitat (x11)	☐	☐	○	○	○	○	○	○
Marine Conservation Society Seychelles (MCSS) (x12)	☐	☐	○	○	○	○	○	○
Fishing Boat Owners Association (FBOA) (x13)	☐	☐	○	○	○	○	○	○
Island Conservation Society (ICS) (x14)	☐	☐	○	○	○	○	○	○
Seychelles Island Foundation (SIF) (x15)	☐	☐	○	○	○	○	○	○
PetroSeychelles (x16)	☐	☐	○	○	○	○	○	○
SWIOFish3 (x17)	☐	☐	○	○	○	○	○	○
Other, please specify: (x20)	☐	☐	○	○	○	○	○	○
Other, please specify: (x19)	☐	☐	○	○	○	○	○	○

Other, please specify: (x18)	☐ ☐ ○ ○ ○ ○ ○ ○

End of Block: Resources sharing with organisations in Seychelles

Start of Block: Direction from/to organisations in Seychelles

Intro3 In this section I am interested in direction *(Examples: mandates, requests, guidance and assignments)* you give to or receive from organisations in Seychelles for your work on achieving the vision, goals and objectives of the Marine Spatial Plan and the blue economy in Seychelles, or for the part of your work that is affected by the Marine Spatial Plan and the blue economy.

Q5 Which of these organisations do you give or receive **direction** to/from **in Seychelles?** Multiple answers possible.

- [ ] Seychelles Conservation and Climate Change Adaptation Trust (SeyCCAT) (1)
- [ ] The Nature Conservancy (TNC) (2)
- [ ] United Nations Development Program (UNDP) (3)
- [ ] Global Environmental Facility (GEF) Programme Coordination Unit (4)
- [ ] Department of Blue Economy (5)
- [ ] Ministry of Environment, Energy and Climate Change (MEEC) (6)
- [ ] Department of Environment (7)
- [ ] Seychelles National Parks Authority (SNPA) (8)
- [ ] Ministry of Agriculture and Fisheries (9)
- [ ] Seychelles Fishing Authority (SFA) (10)
- [ ] Ministry of Land Use and Habitat (11)
- [ ] Marine Conservation Society Seychelles (MCSS) (12)
- [ ] Fishing Boat Owners Association (FBOA) (13)
- [ ] Island Conservation Society (ICS) (14)
- [ ] Seychelles Island Foundation (SIF) (15)
- [ ] PetroSeychelles (16)
- [ ] SWIOFish3 (17)

☐ Other, please specify: (18) _____

☐ Other, please specify: (19) _____

☐ Other, please specify: (20) _____

Carry Forward Selected Choices from "Which of these organisations do you give or receive direction to/from in Seychelles? Multiple answers possible."

Q6 Could you tell me a bit more about your direction giving or receiving between you and these organisations within Seychelles? *(Examples of direction: mandates, requests, guidance and assignments)*

	Do you receive direction from this organisation, or do you provide the organisation with direction?		What is the frequency with which you give or receive direction?				How influential is this direction giving/receiving in enabling you to do your work?		
	I receive direction (1)	I provide direction (2)	Daily (1)	Weekly (2)	Monthly (3)	Ad hoc (4)	Low influence (1)	Medium influence (2)	High influence (3)

Seychelles Conservation and Climate Change Adaptation Trust (SeyCCAT) (x1)	☐	☐	○	○	○	○	○	○
The Nature Conservancy (TNC) (x2)	☐	☐	○	○	○	○	○	○
United Nations Development Program (UNDP) (x3)	☐	☐	○	○	○	○	○	○
Global Environmental Facility (GEF) Programme Coordination Unit (x4)	☐	☐	○	○	○	○	○	○
Department of Blue Economy (x5)	☐	☐	○	○	○	○	○	○
Ministry of Environment, Energy and Climate Change (MEEC) (x6)	☐	☐	○	○	○	○	○	○
Department of Environment (x7)	☐	☐	○	○	○	○	○	○
Seychelles National Parks Authority (SNPA) (x8)	☐	☐	○	○	○	○	○	○
Ministry of Agriculture and Fisheries (x9)	☐	☐	○	○	○	○	○	○

Seychelles Fishing Authority (SFA) (x10)	☐	☐	○	○	○	○	○	○
Ministry of Land Use and Habitat (x11)	☐	☐	○	○	○	○	○	○
Marine Conservation Society Seychelles (MCSS) (x12)	☐	☐	○	○	○	○	○	○
Fishing Boat Owners Association (FBOA) (x13)	☐	☐	○	○	○	○	○	○
Island Conservation Society (ICS) (x14)	☐	☐	○	○	○	○	○	○
Seychelles Island Foundation (SIF) (x15)	☐	☐	○	○	○	○	○	○
PetroSeychelles (x16)	☐	☐	○	○	○	○	○	○
SWIOFish3 (x17)	☐	☐	○	○	○	○	○	○
Other, please specify: (x18)	☐	☐	○	○	○	○	○	○
Other, please specify: (x19)	☐	☐	○	○	○	○	○	○
Other, please specify: (x20)	☐	☐	○	○	○	○	○	○

End of Block: Direction from/to organisations in Seychelles

Start of Block: Information sharing with organisations outside Seychelles

Intro block 2 Part 2 of the questionnaire is about your relationship with other **organisations and ideas/frameworks from outside Seychelles**. There are 3 subjects in this part: information sharing, resources sharing and direction giving/receiving.

Intro 2:1 In this section I am interested in **information** *(Examples: information about new opportunities, relevant science, and stakeholders)* you share with organisations and other human and non-human actors outside Seychelles for your work on achieving the vision, goals and objectives of

the Marine Spatial Plan and the blue economy in Seychelles, or for the part of your work that is affected by the Marine Spatial Plan and the blue economy.

Q7 Which of these organisations, that are from **outside Seychelles**, do you share **information** with? Multiple answers possible.

- ☐ The Nature Conservancy (TNC) International (1)
- ☐ The World Bank (2)
- ☐ Food and Agriculture Organisation (FAO) (3)
- ☐ Global Environmental Facility (GEF) (4)
- ☐ United Nations Development Programme (UNDP) (5)
- ☐ European Union (EU) (6)
- ☐ The United Nations (UN) (21)
- ☐ Environmental Defense Fund (7)
- ☐ WorldFish (8)
- ☐ Ocean Conservancy (9)
- ☐ The Ecosystem Services framework (10)
- ☐ The blue economy agenda (11)
- ☐ The notion of Natural Capital (12)
- ☐ Sustainable Development Goals (13)
- ☐ Other, please specify: (18)

_____

☐ Other, please specify: (19) _____

☐ Other, please specify: (20) _____

Carry Forward Selected Choices from "Which of these organisations, that are from outside Seychelles, do you share information with? Multiple answers possible."

Q8 Could you tell me a bit more about your information sharing with these organisations, that are from **outside Seychelles**? *(Examples of information are: information about new opportunities, relevant science, and stakeholders)*

	Do you receive information from this organisation, or do you provide the organisation with information?		What is the frequency with which you share information?				How influential is the information that you share in enabling you to do your work?		
	I receive information (1)	I provide information (2)	Daily (1)	Weekly (2)	Monthly (3)	Adhoc (4)	Low influence (1)	Medium influence (2)	High influence (3)

The Nature Conservancy (TNC) International (x1)	☐	☐	○	○	○	○	○	○
The World Bank (x2)	☐	☐	○	○	○	○	○	○
Food and Agriculture Organisation (FAO) (x3)	☐	☐	○	○	○	○	○	○
Global Environmental Facility (GEF) (x4)	☐	☐	○	○	○	○	○	○
United Nations Development Programme (UNDP) (x5)	☐	☐	○	○	○	○	○	○
European Union (EU) (x6)	☐	☐	○	○	○	○	○	○
The United Nations (UN) (x21)	☐	☐	○	○	○	○	○	○
Environmental Defense Fund (x7)	☐	☐	○	○	○	○	○	○
WorldFish (x8)	☐	☐	○	○	○	○	○	○
Ocean Conservancy (x9)	☐	☐	○	○	○	○	○	○
The Ecosystem Services framework (x10)	☐	☐	○	○	○	○	○	○

The blue economy agenda (x11)	☐	☐	○	○	○	○	○	○
The notion of Natural Capital (x12)	☐	☐	○	○	○	○	○	○
Sustainable Developme nt Goals (x13)	☐	☐	○	○	○	○	○	○
Other, please specify: (x18)	☐	☐	○	○	○	○	○	○
Other, please specify: (x19)	☐	☐	○	○	○	○	○	○
Other, please specify: (x20)	☐	☐	○	○	○	○	○	○

End of Block: Information sharing with organisations outside Seychelles

Start of Block: Resources sharing with organisations outside Seychelles

Intro 2:2 In this section I am interested in resources *(Examples: staff, time, and equipment)* you share with organisations and other human and non-human actors outside Seychelles for your work on achieving the vision, goals and objectives of the Marine Spatial Plan and the blue economy in Seychelles, or for the part of your work that is affected by the Marine Spatial Plan and the blue economy.

Q9 Which of these organisations, that are from **outside Seychelles**, do you share resources with? Multiple answers possible.

- ☐ The Nature Conservancy (TNC) International (1)
- ☐ The World Bank (2)
- ☐ Food and Agriculture Organisation (FAO) (3)
- ☐ Global Environmental Facility (GEF) (4)
- ☐ United Nations Development Programme (UNDP) (5)
- ☐ European Union (EU) (6)
- ☐ The United Nations (UN) (21)
- ☐ Environmental Defense Fund (7)
- ☐ WorldFish (8)
- ☐ Ocean Conservancy (9)
- ☐ The Ecosystem Services framework (10)
- ☐ The blue economy agenda (11)
- ☐ The notion of Natural Capital (12)
- ☐ Sustainable Development Goals (13)
- ☐ Other, please specify: (18) _____
- ☐ Other, please specify: (19) _____

☐ Other, please specify: (20)

_____

Carry Forward Selected Choices from "Which of these organisations, that are from outside Seychelles, do you share resources with? Multiple answers possible."

Q10 Could you tell me a bit more about your resources sharing with these organisations, that are from **outside Seychelles**? (Examples of resources: information about new opportunities, relevant science, and stakeholders)

	Do you receive resources from this organisation, or do you provide the organisation with resources?		What is the frequency with which you share resources?				How influential are the resources that you share in enabling you to do your work?		
	I receive information (1)	I provide information (2)	Daily (1)	Weekly (2)	Monthly (3)	Adhoc (4)	Low influence (1)	Medium influence (2)	High influence (3)

The Nature Conservancy (TNC) International (x1)	☐	☐	○	○	○	○	○	○
The World Bank (x2)	☐	☐	○	○	○	○	○	○
Food and Agriculture Organisation (FAO) (x3)	☐	☐	○	○	○	○	○	○
Global Environmental Facility (GEF) (x4)	☐	☐	○	○	○	○	○	○
United Nations Development Programme (UNDP) (x5)	☐	☐	○	○	○	○	○	○
European Union (EU) (x6)	☐	☐	○	○	○	○	○	○
The United Nations (UN) (x21)	☐	☐	○	○	○	○	○	○
Environmental Defense Fund (x7)	☐	☐	○	○	○	○	○	○
WorldFish (x8)	☐	☐	○	○	○	○	○	○
Ocean Conservancy (x9)	☐	☐	○	○	○	○	○	○
The Ecosystem Services framework (x10)	☐	☐	○	○	○	○	○	○

The blue economy agenda (x11)	☐	☐	○	○	○	○	○	○
The notion of Natural Capital (x12)	☐	☐	○	○	○	○	○	○
Sustainable Developme nt Goals (x13)	☐	☐	○	○	○	○	○	○
Other, please specify: (x18)	☐	☐	○	○	○	○	○	○
Other, please specify: (x19)	☐	☐	○	○	○	○	○	○
Other, please specify: (x20)	☐	☐	○	○	○	○	○	○

End of Block: Resources sharing with organisations outside Seychelles

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Start of Block: Block 8

Q26 This is the end of the survey. If you have any additional remarks please share them with me here:

_____

End of Block: Block 8

A.3 Fishers and tourism operators questionnaire

I. Name Interviewer:		***V. Interview ID no.:***
II. Date of interview:		
III. District/ landing site:	*Island:*	
IV. Start time/ end time of interview	*Start time:*	*End time:*

Hello, my name is Marleen Schutter. I am a student at Lancaster University, working with the University of Seychelles. I am interested in your opinions about the blue economy and the things you find important in life. I am doing this survey to understand how different people have different preferences, and how that might influence their actions. I am interested in hearing your opinions. Everything that you tell me will be anonymous. The interview will take about 20 minutes. Would you be willing to participate?
Before we start, I would like to give you some participant information and I need to obtain your consent *(Read participant information sheet and consent form and obtain oral consent).*

I. Interaction with the marine environment

1. How often do you participate in each of the following activities in nature?

   Eski ou partisip dan sa bann aktivte dan lanatir souvan?

	1] Never **Zanmen**	2] Once a year **En fwa par lannen**	3] Once a month **En fwa par mwan**	4] Once a week **En fwa par semenn**	5] More than once a week **Plis ki en fwa par semenn**	Do you do this activity with others? **Eski ou fer sa bann activite ek lezot dimun**
1] Fishing **Lapes**	□	□	□	□	□	yes/no **Wi/Non**
2] Going to the beach **Al lo lans**	□	□	□	□	□	yes/no **Wi/Non**
3] Boating/sailing/ kayaking	□	□	□	□	□	yes/no **Wi/Non**
4] Swimming/wading **Naze**	□	□	□	□	□	yes/no **Wi/Non**
5] Diving **Plonze**	□	□	□	□	□	yes/no **Wi/Non**
6] Snorkelling						

	□	□	□	□	□	yes/no **Wi/Non**
7] Other, please specify: **Lezot ankor, spesifye silvouple**	□	□	□	□	□	yes/no **Wi/Non**

2. How often do you eat fish?

   Eski ou manz pwason ase souvan?

1] Never **Zanmen**	2] Occasionally **Okazyonelman**	3] Once a week **En fwa par semenn**	4] Multiple times a week **Detwa fwa par semenn**	5] Every day **Toulezour**
□	□	□	□	□

3. When you eat fish, where do you get it from?

   Letan ou manz pwason, kote ou ganyen?

1] I catch it myself **Si mon lapes mon menm**	2] I buy it on the side of the road **Mon aste obor semen**	3] I buy it on the local market **Mon aste dan bazar**	4] I buy it in a supermarket **Mon aste dan en supermarket**	5] Other, please specify: **Dan lezot landwa, spesifye silvouple:**
□	□	□	□	□

4. When you eat fish, which species of fish do you eat?

   Letan ou manz pwason, ki lepes pwason ou manze?

1] Reef fish, e.g. jobfish, snapper, rabbitfish **Pwason koray, par e.g. zob, bourzwa, kakatwa**	□	4] Frozen pelagic fish **Eski ou kontan bann pwason pelagic kin gany konserve pu enpe letan e.g. ton, macro, bekin, karang**	□
2] Pelagic fish e.g. tuna, mackerel **Bann pwason pelagic e.g. ton, makro**	□	5] Dried fish e.g. dried rabbitfish, dried captain fish, dried mackerel **Eski ou kontan pwason sale e.g. makro sale, captain blan or rouz, kordonnyen**	□
3] Frozen reef fish **Pwason koray kin ganny konserve pou enpe letan**	□	6] Other, please specify: **Lezot kalite, silvouple spesifye**	□

II. Occupation

5. How long have you been working in fishing for?

1] 0-5 years	□	6] 16-20 years	□
2] 6-10 years	□	7] 21-25 years	□
3] 11-15 years	□	8] More than 25 years	□

6. Are you from a family of fishers? (e.g. children, parents or grandparents fishers?)

1] Yes	□	6] No	□

III. Value orientations

In this section, I would like to describe some people, and ask you how much each person is, or is not, like you. Please let me know for each description if this person is very much like you, like you, somewhat like you, a little like you, not like you, or not at all like you.
Dan sa seksyon, mon anvi dekri enpe dimun, e demann ou ki kantite sa bann dimun I parey ou, oubyen pa parey ou. Silvouple fer mon konn sak deskripsyon si sa dimoun I vreman parey ou, parey ou, enpe parey ou, en pti git parey ou, pa parey ou, oubyen pa pare you ditou.

	Very much like me **Vreman parey mwan**	Like me **Parey mwa n**	Some-what like me **Enpe parey mwan**	A little like me **En pti git parey mwan**	Not like me **Pa parey mwa n**	Not like me at all **Pa parey mwan ditou**
1. He/she strongly believes that people should care for nature. Looking after the environment is important to him/her. **Ou vreman kwar ki dimoun I bezwen konsernen pour lanatir. Pran ka ek lanvironman I enportan pou li.**						
2. It is important to him/her that the government ensures his/her safety against all threats. He/she wants the state to be strong so it can defend its citizens. **I vreman enportan pou ou ki gouvernman I bezwen asir sekirite son pep anver okenn danze. Ki leta I reste for e defann son sitwayen.**						
3. It is important to him/her always to behave properly. He/she wants to avoid doing anything people would say is wrong. **I enportan pou ou konport ou byen e ou anpes ou lekor fer keksoz mal.**						
4. He/she thinks it's important not to ask for more than what you have. He/she believes that people should be satisfied with what they have. **I enportan pou pa demann plis ki sa ki ou annan. Ou kwar ki dimun I devret kontant zot avek sa ki zot annan.**						
5. Tradition is important to him/her. He/she tries to follow the customs handed down by his/her religion or family. **Ou kwar ki tradisyon I enportan, Eski ou swiv dan lepa ou fanmir oubyen ou larelizyon?**						

	Very much like me **Vreman parey mwan**	Like me **Parey mwan**	Some-what like me **Enpe parey mwan**	A little like me **En pti git parey mwan**	Not like me **Pa parey mwan**	Not like me at all **Pa parey mwan ditou**
6. He/she believes that people should do what they're told. He/she thinks people should follow rules at all times, even when no-one is watching. **Ou kwar ki dimun I devret fer sa ki zot gany demande pou fer. Ou osi kwar ki dimun I devret swiv lalwa toukou, menm si dimoun pa pe gete.**						
7. It is important to him/her to be rich. He/she wants to have a lot of money and expensive things. **I enportan pou ou ris. Ou anvi annan enta larzan ek bann keksoz ser.**						
8. It is very important to him/her to show his/her abilities. He/she wants people to admire what he/she does. **I vreman enportan pou ou montre ou abilite. Ou anvi dimoun admir ou pou sa ki ou fer.**						
9. Being very successful is important to him/her. He/she hopes people will recognise his/her achievements. **I enportan pou ou fer sikse. Ou kwar dimoun pou rekonnet sikse ki ou'n fer.**						
10. He/she looks for adventures and likes to take risks. He/she wants to have an exciting life. **Ou kontan fer lavantir e pran risk. Ou osi anvi en lavi eksitan.**						

11. It is important to him/her to live in secure surroundings. He/she avoids anything that might endanger his/her safety. **I enportan pou ou viv en lavi dan en landwar an sekirikite e reste alekar kot keksoz ki kapab andomaz ou sekirite**						
12. Having a good time is important to him/her. He/she likes to "spoil" him/herself. **Pas en bon moman I enportan pou ou. Ou kontan gany gate.**						
	Very much like me **Vreman parey mwan**	Like me **Parey mwan**	Some-what like me **Enpe parey mwan**	A little like me **En pti git parey mwan**	Not like me **Pa parey mwan**	Not like me at all **Pa parey mwan ditou**
13. He/she seeks every chance he/she can to have fun. It is important to him/her to do things that give him/her pleasure. **Ou kontan rod nenport loportinite pou anmize. I enportan pou ou fer keksoz ki fer ou plezir.**						
14. It is important to him/her to listen to people who are different from him/her. Even when he/she disagrees with them, he/she still wants to understand them. **I enportan pou ou ekout dimun ki diferan ek ou. Menm letan ou dezagree avek zot, ou kontiyen anvi konpran zot.**						
15. Thinking up new ideas and being creative is important to him/her. He/she likes to do things in his/her own original way. **Vin avek bann nouvo nide e vin kreativ I enportan pou ou. E ou kontan fer keksoz dan ou prop fason orizinal.**						
16. It is important to him/her to get respect from others. He/she wants people to do as he/she says. **I enportan pou dimoun I respe ou e fer sa ki ou diriz zot pou fer**						

17. It is important to him/her to be humble and modest. He/she tries not to draw attention to him/herself. **Ou kwar I enportan pou reste senp e modere. Pa kontan port latensyon anver ou.**						
18. It is important to him/her to make his/her own decisions about what he/she does. He/she likes to be free to plan and not depend on others. **I enportan pou ou fer ou prop desizyon lo ki I fer. E ou kontan lib pou fer ou plan e pa depan lo lezot dimoun.**						
19. He/she thinks it is important that every person in the world be treated equally. He/she believes everyone should have equal opportunities in life. **I enportan pou ki tou dimun dan lemon I gany trete egal. E ou kwar ki dan lavi fodre ki tou dimoun i ganny loportinite egal.**						
20. It's very important to him/her to help the people around him/her. He/she wants to care for their well-being. **Ou kwar ki I vreman enportan pou ed lezot dimun otour ou. E ou konsernen pou zot lasante.**						
21. It is important to him/her to be loyal to his/her friends. He/she wants to devote him/herself to people close to him/her. **Ou kwar ki i enportan pou lwayal avek ou bann zanmi. E ou anvi dedye son lekor pour zot.**						

7. How optimistic are you about the future:

   Kantite konfidans ou annan pou le fitir:

	1] Optimistic **Positive**	2] Neutral **Napa nanryen pou dir**	3] Pessimistic **Annan dout**
1] For yourself and your family **Pou ou lekor ek ou fanmiy**	□	□	□
2] For your country **Pou ou pei**	□	□	□
3] For the world **Pou lemonn antye**	□	□	□

IV. Rank valuation of ecosystem services

I would now like to show you some cards with pictures on them that people have previously said are important about the coral reef environment. I would like to describe each one of them to you and ask you to let me know how important these things are to you. *Use: picture cards, table for answers, service descriptions.*

8. Could you please rank these different aspects of the coral reef environment for me? *(use table below for recording answers)*
9. I would like to ask you, thinking about the statements that we used in the previous section, what kinds of reasons you have in mind when indicating your priorities for these cards.

		2. Rationality and Schwartz value
ES	**1. Rank (1-10)**	What about the service is important to you?
Fishery		
Materials (oil&gas, aggregates)		
Coastal protection		
Sanitation		
Habitat		
Tourism		
Educational		
Bequest		
Access		
Cultural& recreational		

blue economy

In this section, I would like to ask you a few things about the blue economy in Seychelles. The blue economy in Seychelles is defined as a sustainable ocean-based economy. The blue economy is about economic activities that directly or indirectly take place in the ocean, use outputs from the ocean, and put goods and services into ocean's activities and the contribution of those activities to economic growth, social, cultural and environmental wellbeing.

Dan sa seksyon, mon ti a voudre demann ou enpe keksoz lo sekter lekonomi ble Sesel. Lekonomi ble sesel I gany defining konman bann fason soutenab ki bann benefis marin I kontribye anver nou lekonomi. Lekonomi ble I bann akitivite ki direkteman ou indirekteman pran plas dan losean, letan nou servi bann resours dan losean, e letan nou fer bann aktivite dan lespas marin ki kontribye dan nou lekonomi, nou lavi social, kiltirel e byenet lanvironman.

You might have heard about the blue economy, or you might have not heard about it. This does not matter for this study, as I am only interested in your opinions.

Ou kapab in deza tann nonm lekonomi ble, oubyen ou kapab pann deza tan nonm li. Sa pa tro en nessesite pou sa letid, akoz mon selmanenterese avek ou lopinyon.

10. Have you heard about the blue economy?
    Eski oun deza tan nonm lekonomi ble?

1] Yes **Wi**	☐	2] No **Non**	☐

11. If no, reconstruct work in fishing timeline, and ask about policy changes.

Identify changes that are blue economy-related.

12. If yes, what have you heard?
    Si wi, ki ountande lola?

(Let respondent associate freely without seeing the options, tick boxes that are mentioned/describe answer in other)

1] **Debt swap**	☐	7] It has to do with tourism **I annan pou fer avek sekter tourism**	☐
2] Something about James Michel	☐	8] It has to do with fishing **I annan pou fer ek sekter lapes**	☐
3] It is about conservation **I annan pou fer ek konservasyon**	☐	9] It has to do with oil&gas **I annan pou fer ek delwil ek gas**	☐
6] It is about economic growth/sustainable development **I annan pou fer avek augmantasyon dan lekonomi e devlopman soutenab**	☐	10] Other, please specify: **Lezot keksoz, Silvouple spesifye:**	☐

13. Where do you receive information on the blue economy from, and how much do you trust these sources of information?
    Kote ou resevwar lenformasyon lo lekonomi ble e ki kantite konfyans ou annan dan sours sa bann lenformasyon?

	1] Very knowledgeable **Bokou konesans**	2] Moderately knowledgeable **Enpe konesans**	3] Not knowledgeable **Pa konn nanryen**

1] Family **Fanmiy**	□	□	□
2] Neighbours or friends **Vwazen ek zanmi**	□	□	□
3] Colleagues **Koleg**	□	□	□
4] Newspaper **Nasyon**	□	□	□
5] Television **Televizyon**	□	□	□
6] Internet/social media **Internet/rezo sosyal**	□	□	□
6] Local politicians **Bann politisyen lokal**	□	□	□
7] National politicians **Bann politisyen internasyonal**	□	□	□
8] Other, please specify: **Lezot sours, silvouple spesifye:**	□	□	□
9] I do not receive any information **Mon pa resevwar okenn lenformsyon** □	N/A	N/A	N/A

14. Which areas of the ocean do you think the blue economy affects?

Ki rezyon dan losean ki ou kwar lekonomi ble I gany afekte?

1] Inshore **Pre ek lakot**	□	2] Offshore **Lwen ek lakot**	□
3] Other, please specify: **Lezot fason, silvouple spesifye:**	□	4] Prefer not to answer **Mon prefere pa reponn**	□

15. Has the blue economy affected your day-to-day life? If so, how?
Eski Lekonomi Ble in afekte ou lavi toulezour? Si wi, kimanyer?

1] Restricted access **Restriksyon akse**	□	5] Created more financial opportunities e.g. Blue Bonds **Kree plis loportinite finansyel:**	□
2] Restricted practices e.g. anchoring **Restriksyon Pratik eg.**	□	6] Increased competition from other industries that are using the ocean	□

		Plis konpetisyon kont bann lezot lendistri ki pe servi losean	
3] Created new opportunities e.g. more/diversified fishing **Kree nouvo loportinite e.g divers fason lapes**	☐	3] Other, please specify: **Lezot, silvouple spesifye:**	☐
4] Made me think differently about the ocean, please specify: **Fer mon pasn diferan lo losean, silvouple spesifye**:	☐	**4] Prefer not to answer Prefere pou pa reponn:**	☐

16. Where do you think the blue economy ideas come from? **Kote ou kwar lide lekonomi ble I sorti?**

1] Seychelles government (*Please specify Ministry/Department)* **Governman sesel? Si wi spesifye ki gouverman**	☐	7] Governments from outside Seychelles **Bann gouvernman an deor sesel**	☐
2] **James Michel**	☐	8] Seychelles Tourism and Hospitality Association **Sekter tourism sesel**	☐
3] **The Nature Conservancy**	☐	9] The Department of Blue Economy **Departman lekonomi ble**	☐
6] Seychelles Fishing Authority **SFA**	☐	10] Other, please specify: **Lezot sours, silvouple spesifye:**	☐

17. Who do you think is benefiting from the blue economy? **Lekel ou kwar ki benefisye atraver lekonomi ble?**

1] Seychelles government **Governman Sesel**	☐	6] The environment **Lanvironman**	☐
2] Seychelles population **Popilasyon Sesel**	☐	7] Other, please specify: **Lezot, silvouple spesifye:**	☐
3] The economy **Lekonomi**	☐		

Please indicate whether you agree or disagree with the following statements about the blue economy:

Statement	Konpletman pa dakor	Patro dakor	Napa okenn konmanter	Enpe dakor	Konpletman dakor	Pa konnen
1. I believe it is wrong to have financial reasons for environmental protection. **Eski ou kwar I mal pou baz protection lanvironnman lo bann rezon finansyel.**	1	2	3	4	5	☐
2. In the blue economy, protection and recovery of ocean ecosystems and biodiversity are a priority. **Eski ou kwar ki dan sekter lekonomi ble, proteksyon e rekiperasyon nou bann lekosistenm marin ek son bann labita I en priorite.**	1	2	3	4	5	☐
3. I believe that by expressing the importance of nature in economic terms, people will think more about the consequences of acting upon nature. **Eski ou kwar ki par exprim linportans lanatir an term ekonimik, dimoun pou mazin plis lo konsekans zot aksyon anver lanatir.**	1	2	3	4	5	☐
4. The blue economy fails to take into account the cultural importance of fisheries in Seychelles. **Eski u kwar ki lekonomi ble Sesel pa pran an konsiderasyon linportans kitirel pou lapes.**	1	2	3	4	5	☐
5. I believe financing conservation with money from abroad means a loss of sovereignty. **Eski ou kwar ki finansman konservasyon sorti aletranzer I vedir en perd pouvwar.**	1	2	3	4	5	☐
6. The goal of the blue economy is to make sure the ocean is utilised for the economy. **Eski u kwar ki bi lekonomi ble I pou fer sir ki losean I gany servi dan en fason ki I kapab kontribye plis dan lekonomi**	1	2	3	4	5	☐
7. Oil and gas exploration and mariculture can make enough money to compensate for the environmental damaged they cause. **Eksplorasyon delwil ek gas osi byen ki marikiltir I kapab fer ase larzan to kouver bann domaz ki zot fer lo lanvironman.**	1	2	3	4	5	☐
8. I believe when it comes to promoting behavioural change, we should be tapping into the intrinsic values that people hold for nature, rather than purely economic values. **Eski ou kwar ki letan nou pe sey promot sanzman dan konportman dimun, nou bezwen sey vwar bann valer entern ki dimun I annan anver lanatir, dan plas zis regard bann valer ekonomik.**	1	2	3	4	5	☐

Statement	Konpletman pa dakor	Patro dakor	Napa okenn konmanter	Enpe dakor	Konpletman dakor	Pa konnen
9. The blue economy can provide some much-needed coordination between different organisations and stakeholders related to the environment. E**ski ou kwar ki lekonomi ble I kapab fer provizyon pou bann kordinasyon kle pour proteksyon lanvironnman ant bann loganizasyon ek sekter an**	1	2	3	4	5	□
10. Marine conservation is a hard sell. The only way to sell it is through sustainable development. **Eski ou kwar ki konservasyon marin I diffisil. E ki sel fason pou fer li I atraver devlopman ekonomik.**	1	2	3	4	5	□

18. We talked about the importance of different parts of the environment with the picture cards. What do you think the order of these benefits is under the blue economy philosophy?
(Just try to get at the top priorities, and ask for reasons)

		2. Reason
ES	**1. Rank (1-10)**	Why are these services a top priority within the blue economy philosophy?
Fishery		
Materials (oil&gas, aggregates)		
Coastal protection		
Sanitation		
Habitat		
Tourism		
Educational		
Bequest		
Access		

Cultural& recreational		

19. Have you noticed a change in the prioritisation of the benefits that are mentioned above since the blue economy emerged? *In society, policy makers*
20. If yes: how has this affected you?

V. Social capital

21. I want to ask you some questions about how much you trust different types of people. In general, how much do you trust:

	Not at all	Distrust more people than trust	About half-half	Trust more people than distrust	Trust all	Don't know/ N/A
a. Family						
b. People you work with						
c. People in the area you live in						
d. Community leaders						
e. District administration						
f. Police/security						
g. Local government officials						
h. NGO staff						

VI. Demographics [REMINDER: FOLLOWING QUESTIONS ARE FOR STATISTICAL PURPOSES ONLY]

22. Were you born in Seychelles?

1] Yes	☐
2] No	☐

23. If not, where are you from? _____
24. Why did you move to Seychelles? _____
25. For how many years have you been living in Seychelles? _____ years

26. How would you describe your ethnicity?

1] Creole	☐	6] Indian	☐
2] British	☐	7] Other, please specify:	☐
3] French	☐	8] Declined to answer	☐
4] Chinese	☐		

27. How many people live in your household?

1] Number of adults		2] Number of children under 18	

28. Gender:

1] Male	☐	2] Female	☐
3] Other, please specify:	☐	4] Prefer not to answer	☐

29. How old are you?

1] 18-19	☐	8] 50-54	☐
2] 20-24	☐	9] 55-59	☐
3] 25-29	☐	10] 60-64	☐
4] 30-34	☐	11] 65-69	☐
5] 35-39	☐	12] 70+	☐
6] 40-44	☐	13] Prefer not to answer	☐
7] 45-49	☐		

30. What is the highest level of education that you have completed?

1] None	☐	4] Post-secondary (non-tertiary) education	☐
2] Primary school	☐	8] Tertiary education	☐
3] Secondary school	☐	9] Prefer not to answer	☐

Income and employment

31. What jobs do you and other people in your house do that bring in food or money to your house? Which is the most important, which is the top earner and are they permanent or casual jobs?

ACTIVITY	Check if respondent	# of People	Rank importance

Fishing industry			
Farming industry			
Salaried Employment			
Tourism			
Other			

Total number of occupations_____ Number of different occupations_____

32. What is the gross income earned in your household **before taxes or other deductions** in SCR last month?
(*Use: income card, and remind the respondent that you are not aware of the meaning of the income categories due to the random lettering)*

LETTER: …….

33. Thank you very much for your time. Do you have any further questions or comments for me?

RECORD IN BOX BELOW:

IF THE RESPONDENT WANTS TO LEAVE HIS OR HER PERSONAL INFORMATION IN ORDER TO RECEIVE INFORMATION OF THE REPORT, ASK HIM OR HER TO DO SO NOW AND RECORD IT.

NAME: _____PHONE:_____EMAIL: _____

THIS IS THE END OF THE QUESTIONNAIRE; THANK THE RESPONDENT FOR HIS/HER TIME AND PATIENCE!!!

A.4 Ecosystem services photos and descriptions

Service	Picture	Description
Fishery		This picture shows fish that have been caught by fishers. They might sell these fish or use them to feed their families. This picture illustrates the benefit we gain from the fish we catch and sell
Coastal protection	 	This picture shows a rough sea and some beach sand washed away by the waves. The coral reef provides a barrier against the force of these waves. This picture illustrates the benefits we gain from having the reef buffer the force of the waves.

Sanitation

This picture shows fishers gutting and washing their fish. The sea takes away a lot of waste for us. This picture illustrates the benefits we gain from using the sea to wash and clean, knowing that when we come back tomorrow the waters will be clear again.

Habitat

This picture shows a healthy coral reef with many fish and places for the small fish to hide. This picture illustrates the benefits we gain from having a healthy coral reef habitat

Tourism

This picture shows tourists getting on board a dive boat, ready to enjoy the marine environment. This picture illustrates the benefits we gain from being able to relax and enjoy the marine environment or having others come and enjoy it in this way.

Bequest

This picture of youth in Seychelles represents the future of the coral reefs. This picture illustrates the benefits we gain from knowing we will have healthy reefs that we can pass on to our children so that they can benefit from all the benefits that we have today.

Education

This picture shows some adults and children learning about the sea. There is a lot of knowledge in the coral reef environment that school children can come and learn about or scientists come and study. This picture illustrates the benefits we gain from the knowledge from the time we and our families have spent in the marine environment

Culture and recreation

This picture shows some people getting ready for a birthday party with family and friends on the beach. This picture illustrates the benefits we gain from being able to use the beach and the sea for cultural and recreational activities.

Access

This picture shows direct access from the roadside to the beach and the sea. This picture illustrates the benefits we gain from being able to access the beach and the sea with no barriers or other restrictions.

A.5 Income card used in surveys

T	**less than 3,000**
U	**3000-5,000**
B	**5,000-10,000**
N	**10,000-15,000**
F	**15,000-20,000**
V	**20,000-25,000**
G	**25,000-30,000**
A	**more than 30,000**

Household income per month in Seychelles rupees