Constructing Narratives of Loss and Damage

Framing, Experiences, and Governance in Tropical Fisheries through Blue Justice

N'guetta, Alicia

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LUND
UNIVERSITY

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Abstract:

Tropical fisheries are at the frontline of climate impacts and rising loss and damage. Yet, limited attention has been paid to fisheries, particularly "small-scale" fisheries, which play a vital role in sustaining livelihoods, ways of life, and well-being. With no consistent and sometimes contested definition, loss and damage refers to the negative impacts of climate change that were not addressed successfully by mitigation and adaptation. As a reality in everyday life, yet a topic of many competing interests in its construction, this thesis explores how loss and damage is framed, experienced and governed in tropical small-scale fisheries. Through an empirical investigation in Martinique (France), I first reflect on the framing of loss and damage for fisheries actors and its interplay with dominant framings of loss and damage. I then look into fishers' experiences and knowledge of loss and damage, as well as narratives across actors, to provide empirical evidence for an inclusive and justice-oriented governance in this area. I draw on critical constructivist theories to frame the study's boundaries and I use a Blue Justice lens to analyse situated knowledges, values, and hermeneutical injustices in fisheries. Four distinct but interlinked academic papers drawing on qualitative methods are included. Paper I reviews the framing of loss and damage in fisheries. Paper II empirically analyses fishers' situated knowledges of socio-ecological changes to inform loss and damage. Paper III explores the multidimensionality of loss and damage, reflecting on (in)tangible, non-finite and ambiguous, and disenfranchised grief dimensions. Finally, Paper IV proposes an equity framework for governing loss and damage in fisheries. The findings show that loss and damage has been constructed mainly through an economic and quantitative lens, contrasting with an understanding of loss and damage as multidimensional, relational, and complex in everyday life. Shaped by both historical climatic and non-climatic drivers, loss and damage is profoundly contextual and bound up with unresolved social justice matters. The findings reveal that experiences of environmental loss influence other forms of loss and damage. However, the ambiguous nature of these losses complicates the identification of temporalities and adaptation strategies, and has deep emotional implications. By advancing our understanding of the nature of loss and damage through the lived experiences of people (i.e. fishers), this thesis contributes to the theoretical understanding of loss and damage, with the aim of supporting increase social justice and a sustainable future.

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Avec une reconnaissance profonde pour les bénédictions, et les orientations qui ont guidé mon parcours, et pour l'exemple intemporel dont la vie continue d'inspirer, et d'éclairer.

A ma mère, A ma famille

"Stories matter. Many stories matter. Stories have been used to dispossess and malign, but stories can also be used to empower and humanize. Stories can break the dignity of people, but stories can also repair that broken dignity."

Chimamanda Ngozi Adichie – The Danger of A single Story.

Table of Contents

Abstract 9
Résumé 10
Acknowledgements 11
List of papers 13
Other relevant publications 14

Prologue 15

Introduction 19
Loss and damage associated with climate change 19
Problematising loss and damage 20
From top-down visions to lived experiences of climate change loss and damage in tropical fisheries 23
Aim and research questions 26
Overview of papers 27
Scope of analysis 28

Conceptual framework 33
Introduction to the conceptual framework 33
Historical and theoretical context 33
Theoretical foundations 35
"Constructive ambiguity" of loss and damage 36
Integrating a Blue Justice lens 38
Key concepts of the framework 40
Synthesis and implications 43

Methods and materials 45
Qualitative approach 45
Case study 46
Context of Martinique fisheries 48
Data collection 51
Data analysis 55
Research positionality 57
Limitations 58

Findings and discussions 61

Framing loss and damage in fisheries 61
Situating loss and damage in the everyday 65
From bottom-up lived experiences to a top-down vision of loss and damage 68
Conclusion 73
Summary of findings 73
Contribution 74
Limitations and future directions 76
Wider implications 77
References 79

List of figures

Figure 1. Relationship between geographical scope and unit of analysis across the thesis papers 31
Figure 2: Key concepts of the framework 42
Figure 3. Map of zones where fishing is forbidden 49
Figure 4: Case study sites 50
Figure 5: Typology of loss by the UNFCCC 55
Figure 6: A multidimensional framing of loss and damage 62

List of tables

Table 1: Overview of papers and the main research questions (RQs) addressed by them 27
Table 2: Data collection methods for each thesis paper (I–IV) 51
Table 3: Data collection tools and respondents 53

Abstract

Tropical fisheries are at the frontline of climate impacts and rising loss and damage. Yet, limited attention has been paid to fisheries, particularly "small-scale" fisheries, which play a vital role in sustaining livelihoods, ways of life, and well-being. With no consistent and sometimes contested definition, loss and damage refers to the negative impacts of climate change that were not addressed successfully by mitigation and adaptation. As a reality in everyday life, yet a topic of many competing interests in its construction, this thesis explores how loss and damage is framed, experienced and governed in tropical small-scale fisheries. Through an empirical investigation in Martinique (France), I first reflect on the framing of loss and damage for fisheries actors and its interplay with dominant framings of loss and damage. I then look into fishers' experiences and knowledge of loss and damage, as well as narratives across actors, to provide empirical evidence for an inclusive and justice-oriented governance in this area. I draw on critical constructivist theories to frame the study's boundaries and I use a Blue Justice lens to analyse situated knowledges, values, and hermeneutical injustices in fisheries. Four distinct but interlinked academic papers drawing on qualitative methods are included. Paper I reviews the framing of loss and damage in fisheries. Paper II empirically analyses fishers' situated knowledges of socio-ecological changes to inform loss and damage. Paper III explores the multidimensionality of loss and damage, reflecting on (in)tangible, non-finite and ambiguous, and disenfranchised grief dimensions. Finally, Paper IV proposes an equity framework for governing loss and damage in fisheries. The findings show that loss and damage has been constructed mainly through an economic and quantitative lens, contrasting with an understanding of loss and damage as multidimensional, relational, and complex in everyday life. Shaped by both historical climatic and non-climatic drivers, loss and damage is profoundly contextual and bound up with unresolved social justice matters. The findings reveal that experiences of environmental loss influence other forms of loss and damage. However, the ambiguous nature of these losses complicates the identification of temporalities and adaptation strategies, and has deep emotional implications. By advancing our understanding of the nature of loss and damage through the lived experiences of people (i.e. fishers), this thesis contributes to the theoretical understanding of loss and damage, with the aim of supporting increase social justice and a sustainable future.

Résumé

Les pêcheries tropicales sont en première ligne face aux impacts climatiques et à l'augmentation des pertes et des dommages. Pourtant, dans le contexte des pertes et dommages associées aux changements climatiques peu d'attention a été accordée à la pêche, en particulier à la pêche « à petite échelle », qui joue un rôle vital dans le maintien des moyens d'existences, des modes de vie et du bien-être de millions d'individus. Sans définition cohérente et parfois contestée, les pertes et dommages désignent les effets négatifs du changement climatique qui n'ont pas pu être adressés par les stratégies d'atténuation, d'adaptation et de gestion des risques. Cette thèse explore comment les pertes et dommages sont conceptualisés, vécus et gouvernés dans les pêches tropicales de petite échelle. À travers une enquête empirique réalisée en Martinique (France), cette recherche s'appuie sur les expériences et les savoirs situés des pêcheurs et autres acteurs liés à la pêche concernant ces enjeux, afin de fournir des preuves empiriques pour une gouvernance inclusive et axée sur la justice. Les théories constructivistes critiques sont mobilisées pour délimiter les frontières de l'étude, et la 'Justice Bleue' est adoptée comme approche pour analyser les savoirs situés, les valeurs et les injustices herméneutiques liés aux pertes et dommages. Quatre articles académiques distincts mais interconnectés, s'appuyant sur des méthodes qualitatives, sont inclus. L'article I, à travers une revue systématique de la littérature, examine les pertes et les dommages dans le secteur de la pêche. L'article II analyse empiriquement les savoir situés des pêcheurs sur les changements socio-écologiques afin de déterminer les pertes et les dommages. L'article III explore la dimension multidimensionnelle des pertes et dommages, en se concentrant sur les aspects intangibles, non finis, ambigus et le deuil invisibilise engendré. Enfin, l'article IV propose un cadre conceptuel d'équité pour gouverner les pertes et dommages dans les pêches. Les résultats montrent que les pertes et les dommages ont été construits principalement dans une perspective économique et quantitative, contrastant avec une perspective multidimensionnelle, relationnel et complexes ancrés dans le vécue. Cette approche empirique met en lumière un façonnement des pertes et dommages par des facteurs contextuels, climatiques et non climatiques, historiquement liés à des enjeux de justice sociale et écologique non résolus. Les résultats révèlent, en particulier, que les pertes et dommages environnementales donnent lieu à d'autres formes (e.g. social, culturel et émotionnel). Cependant, la nature ambiguë de ces pertes et dommages complique l'identification des temporalités et des stratégies d'adaptation. En faisant progresser la compréhension de la nature et de l'étendue des pertes et dommages à travers les expériences vécues, cette thèse contribue à l'avancement de la compréhension théorique des pertes et dommages associés aux changements climatiques, dans le but de soutenir la justice sociale et un avenir durable pour la pêche et les océans.

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One is not rich because one has a lot, but because one gives a lot.
Ivorian proverb

Man lé di tout lé péchè atè Matinik an granmèsi padavwè zot asepté épi tout bon tjè zot, ba mwen an bel pal adan travay wouchach-la man ka fè a. Lamenm lamenm, zot réponn prézan tout lè man té bizwen zot, zot soutjenn mwen, zot fè mwen konfians, mé osi, zot montré mwen sa zot té sa fè épi anpil kouraj, san janmen ladjé. Tousa zot poté ba mwen té potalan pou man rivé bout travay tala. Si sé pa té zot, wouchach-tala pa té ké janmen bout. Mèsi anpil, mèsi anlo, mèsi anchay pou pal-la zot ba mwen-an. Si sé pa té zot ek travay-la zot ka fè-a, Lanmè pé té ké Lanmè. Péchè, tousa zot sav, manniè zot ka bat, manniè zot enmen Lanmè épi lapech, tout bagay-tala fè wouchach-mwen vansé pou rivé bout. Merci à vous, et à tous ceux qui contribué à la recherche.

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A la lumière des lumières… Merci

List of papers

Paper I
N'Guetta A, Boyd E, Krause T, Jackson G. Loss and damage in tropical fisheries: A critical systematic review of people, climate, and fisheries, *Reg Environ Change 25, 36 (2025).* https://doi.org/10.1007/s10113-025-02374-0

Paper II
N'Guetta A. Loss and damage in fisheries: Building on fishers' situated knowledge to inform ways of knowing. *Maritime Studies,* Accepted subject to corrections.

Paper III
N'Guetta A, Boyd E. Loss and Damage in fisheries: (In)tangible, Ambiguous, and Disenfranchised. *Global Environmental Change,* In review.

Paper IV
N'Guetta A, Boyd E, Failler P. An equity framework for governing loss and damage in fisheries: Why do we need to conceptualise equity in loss and damage and for whom. Manuscript in preparation.

Author's contribution to the papers

Paper I
I led the conceptualisation of the paper, with guidance and contributions from EB, TK, and GJ regarding design, structure and framing. I carried out the data collection, analysis and writing. EB, TK, and GJ provided feedback on the writing. EB contributed to revising the manuscript.

Paper II
I wrote the paper as the sole author.

Paper III
I led on the conceptualisation of the paper, with guidance and contributions from EB regarding design, structure and analysis. I carried out the data collection and curated the data. I performed the analysis and interpretation of results. I prepared the initial draft of the manuscript. EB contributed to writing, reviewing, and editing the manuscript. All authors read and approved the final version of the manuscript.

Paper IV
I led on the conceptualisation of the paper, with guidance and contributions from PF and EB regarding design, structure and analysis. All authors contributed to the writing process.

Other relevant publications

Boyd, E., Chaffin, B. C., Dorkenoo, K., Jackson, G., Harrington, L., **N'Guetta**, A., ... & Stuart-Smith, R. (2021). Loss and damage from climate change: A new climate justice agenda. *One Earth*, *4*(10), 1365-1370 DOI: 10.1016/j.oneear.2021.09.015

Jackson, G., **N'Guetta, A.,** De Rosa, S. P., Scown, M., Dorkenoo, K., Chaffin, B., & Boyd, E. (2023). An emerging governmentality of climate change loss and damage. Progress in Environmental Geography, 2(1-2), 33-57. https://doi.org/10.1177/27539687221148748

Simeoni C., Furlan E., Pham H. V., Critto A., de Juan S., Trégarot E., Cornet CC., Meester E., Fonseca C., Botelho AZ., Krause T., **N'Guetta A**., Espinoza Cordova F., Failler P., & Marcomini, A. (2023). Evaluating the combined effect of climate and anthropogenic stressors on marine coastal ecosystems: Insights from a systematic review of cumulative impact assessment approaches. *Science of the Total Environment*, *861*, 160687. https://doi.org/10.1016/j.scitotenv.2022.160687

Walters, R J., Becker, P., **N'Guetta, A.,** Persson, A., Rummukainen, M., Smith, HG., Wullenkord, M., Boyd, E. Ecological Loss and Damage': Don't lose it before it's lost! Manuscript in preparation.

Prologue

Climate change is here for sure, we don't know what fish we will get and when. Every day is unpredictable. We are used to this change, but since several years it has increased and every day, we have administrative rules that add additional pressures on us, we have to follow these rules while dealing with the sargassum, the chlordecone, where and what we can or not fish, the climate and our personal life. We have to fight to remain who we are, fishers before all. A fisher, Martinique, 6/05/2022

Walking on the Caribbean coast of Martinique (a part of France and a European Union (EU) outermost region), we are immersed in the world of fishers. Their boats, nets, and markets are positioned on the beaches. When we look around, an intriguing fact becomes apparent: traditional houses in the area are oriented in a way that does not prioritise a view of the sea. The sight reveals a painful story of harm and dispossession.

For centuries, Martinique's fishers have braved the sea, from before dawn to the last hours of each day, their lives tied up with the rhythm of the sea and its surroundings, the seascape. When the fishing is good, fishers' return to land is joyful: their clients wait for them with joy and excitement, eager to purchase their fish and to prepare delicious traditional dishes. In previous periods, Martinique's fishers were so busy that, according to one fisher, they *"did not have time to touch land".* For Martinique's fishers, the sea and fisheries are not just a livelihood: they are a way of life, a part of their history, a culture transmitted intergenerationally; they are also a part of Martinique's identity.

However, this relationship has changed in recent years: the sea itself is changing, along with the species that live in or from it, marine and coastal ecosystem services, and the fisheries sector. The predictability of fish distribution is now gone. Slow and abrupt changes and uncertainty mark the everyday lives of fishers who are fighting to preserve their traditions and to sustain fisheries in their islands. Climate change is a reality, and fishers are at the forefront of adapting.

A Martinique proverb states: *"You have to go by the sea to learn the language of the fish".* This thesis is an invitation to understand and recognise loss and damage in the everyday, to witness how it is framed, experienced and governed in the

context of small-scale fisheries. Precisely, it is an invitation to set sail and learn from, and build with, those at the forefront of climate change.

Photo. Town of Case-Pilote

Photo. Fishing shelters at the Port of Case-Pilote.

Photo. Fishers disentangling a net full of sargassum algae in Le Prêcheur

Introduction

Loss and damage associated with climate change

Insufficient effort by many countries to reduce greenhouse gas emissions has been the object of contentious discussions between the most-emitting and least-emitting countries, in the context of under the United Nations Framework Convention on Climate Change (UNFCCC). These tensions crystallise around recognition of the uneven impact of climate change on people and societies worldwide (Boyd et al., 2021; Dorkenoo et al., 2022; IPCC, 2021; FAO, 2023). Countries that are the most impacted by climate change demand not to bear the cost of climate change alone and have continuously raised the social justice and ethical imperative behind tackling climate change (Boyd et al., 2021; Ferreira, 2021; Kraal et al., 2023; Sircar et al., 2024), emblematically illustrated by the case of loss and damage[1].

In 1991, the Alliance of Small Island States (AOSIS) submitted a proposal for an insurance pool for the loss and damage they suffer from sea level rise due to emitting countries (Thomas and Benjamin 2018; Calliari et al., 2020; Appadoo 2021; van der Geest and Warner, 2020; Boyd et al. 2021). It took two decades and, notably, an increase in scientific evidence between the Intergovernmental Panel on Climate Change's (IPCC's) fourth and fifth assessments, to recognise that not all impacts can be tackled by mitigation and adaptation (IPCC, 2007; IPCC, 2014; van der Geest and Warner, 2020; Benjamin and Thomas, 2023), leading to loss and damage being explicitly present in the sixth assessment report (IPCC, 2022), after growing evidence and advocacy (Benjamin & Thomas, 2023; Orlove et al., 2023). In 2013, the concept of Loss and Damage was institutionalised under the UNFCCC, through the Warsaw International Mechanism (WIM) and its Executive Committee (WIM ExCom)[2], to advance knowledge on Loss and Damage. In 2015, at the Conference

[1] This thesis uses **l**oss and **d**amage to refer to the losses and harms brought about by the impacts associated with climate change which is the thesis focus, and **L**oss and **D**amage to refers to the policy debate.

[2] The WIM aims to (i) enhance knowledge and understanding of comprehensive risk management approaches; (ii) strengthen dialogue, coordination, coherence and synergies among relevant stakeholders; and (iii) enhance action and support to address loss and damage. The WIM ExCom comprises five thematic groups: (i) the Expert Group on Slow-Onset Events; (ii) the Expert Group on Non-Economic Losses; (iii) the Technical Expert Group on Comprehensive Risk Management

of Parties (COP) 21 in Paris, Article 8 of the Paris Agreement came into force, emphasising the need for knowledge and funding "to minimise, avert, and address loss and damage from climate change" (UNFCCC, 2015). At COP 27, the establishment of the Loss and Damage Fund was agreed upon, to operationalise the Santiago Network, which aims to avert, minimise, and address loss and damage in developing countries. However, the modalities for the fund are still under development, particularly the criteria for accessing funds under it.

Problematising loss and damage

Despite progress in policy and science, loss and damage remains undefined and contested (Boyd et al., 2021; UNEP, 2023; FAO, 2023; Lam et al., 2024). Loss and damage broadly refers to the negative impacts of climate change (extreme and slow-onset events) that cannot be avoided by mitigation and adaptation efforts (van der Geest and Warner, 2020; UNEP, 2023). However, the conceptualisation of loss and damage, as well as its governance, remains contentious and has been criticised for being shaped by historically dominant forms of knowledge within the global governance of climate change policy. This body of knowledge is predominantly rooted in traditional Western scientific paradigms, emphasising, for instance, biophysical impacts, and quantifiable and economic assessments, often detached from the contextual lived experiences and narratives of those who are most impacted. There is increasing recognition of the need to move towards place-based knowledge to achieve a more inclusive and comprehensive understanding of climate impacts. For instance, Boyd et al. (2017, 2021) noted different framings of loss and damage between Annex I[3] and non-Annex I countries. Policymakers framed loss and damage as either a matter of (i) adaptation and mitigation impacts, emphasising the need to address greenhouse gas emissions, (ii) managing the risk of climate impacts, (iii) recognising the limits of adaptation to minimise and address loss and damage, or (iv) existence, given the unfair and disproportionate impacts of climate change on those that have historically contributed the least to greenhouse gas emissions. The latter is the position of non-Annex I countries, such as the Small Islands Developing States (SIDS). Questions such as whose experiences are recognised, how loss is defined, and who gets to decide remain contested.

(TEG-CRM); (iv) the Task Force on Displacement (TFD); and (v) the Expert Group on Action and Support (ASEG).

[3] "Annex I Parties include the industrialized countries that were members of the OECD (Organisation for Economic Co-operation and Development) in 1992, plus countries with economies in transition. Non-Annex I Parties are mostly developing countries. Certain groups of developing countries are recognized by the Convention as being especially vulnerable to the adverse impacts of climate change, including countries with low-lying coastal areas and those prone to desertification and drought" (UNFCCC, online).

Debates surrounding the causes of loss and damage further reveal persistent tensions between perspectives that emphasise the attribution of specific impacts to anthropogenic climate change, and broader justice-oriented frameworks that call for us to consider losses and damages within a given historical socio-ecological context, in which non-climatic processes (e.g., social, environmental, inequities, political and economic) intersect with climate change impacts (Huggel et al., 2019; Motschmann et al., 2020; Ayeb-Karlsson et al., 2023; Van der Geest, 2024). Risks of inequities and the limitations of solely relying on attribution science have been underscored, given the lack of data worldwide to feed this science (Lusk, 2017; Thomas and Benjamin 2018; Boyd et al., 2021; King et al., 2023; Sircar et al., 2024). Additionally, the lack of focus on slow-onset events driving loss and damage is frequently underscored (van der Geest and van der Berg 2021; Shäfer et al., 2021). Currently, most countries report loss and damage based on observed and known climate events, for instance, as referenced in the IPCC (e.g. TS.5 in IPCC, 2021) and in local and scientific observations (Thomas and Benjamin, 2018; Sircar et al., 2024). The critical need to rely on knowledge from vulnerable communities to ensure equity has been raised by the Transitional Committee of the Loss and Damage Fund (2023), which is in charge of the operationalisation of the fund . Furthermore, the WIM EXCOM's (2023–2027) latest work plan emphasises expanding "*knowledge of the role of traditional knowledge in averting, minimizing and addressing non-economic losses"* (UNFCCC, 2022 p. 8). Disentangling local and global drivers of loss and damage remains complex, particularly when trying to unpack what matters, for whom, and at what scale. As a result, the deeper "why" of loss and damage (why it occurs, for whom, at what scale) remains unexamined, hinting at forms of epistemic exclusion and marginalisation in loss and damage.

Limitations in recognising pluralities of knowledge in the context of loss and damage further raise critical questions about what counts (and is valued) as loss and damage, for whom, and how such losses are understood and addressed by different actors. Under the UNFCCC (2013), loss and damage is categorised as either economic loss (tradable in the market, e.g. infrastructure, income, production) or non-economic loss[4] (non-tradable in the market, often intangible, e.g. culture, rights, biodiversity, ecosystem services, mobility, traditional knowledge). However, current tools rely on metrics that aim to achieve standardisation. While useful for assessing and quantifying economic loss and damage, these metrics are limited as regards engaging with the subjective nature of loss and damage, as expressed through its intangible dimensions, which are critical for those impacted. There are as yet few localised studies of non-economic loss and damage (Serdeczny et al., 2016; Boyd et al., 2021; Henrique et al., 2022; Dorkenoo et al., 2022; Van Schie et

[4] Non-economic losses are thematically classified by the UNFCCC (2016) as individual, societal or environmental.

al., 2024; Ayeb-Karlsson et al., 2023; Ayeb-Karlsson et al., 2024; Boyd et al., forthcoming). There is thus a need for further critical empirical examination in different contexts and places.

Despite being recognised as some of the most vulnerable sectors to climate change, agrifood systems—essential for the livelihoods, well-being, and way of life of billions—have yet to fully engage with loss and damage (FAO, 2023). As with climate science, fisheries science has been widely criticised for its overreliance on quantitative and economic frameworks. This emphasis similarly shapes prevailing methodologies for assessing loss and damage in the fisheries sector. These methodologies predominantly rely on quantitative economic valuation, particularly in the context of ex-post disaster assessments, such as the Damage and Loss Assessment for agriculture and fisheries sectors or the Post-Disaster Needs Assessment (FAO, 2023). However, it is evidenced in the literature that loss and damage hold non-monetary values, tied to emotions, attachment, identity and belonging, critical in defining what counts as a loss and damage (Morrissey & Oliver-Smith, 2013; Barnett et al., 2016; Serdeczny et al., 2016; Boyd et al., 2021; Henrique et al., 2022; van Schie et al., 2023). This further reveals a critical gap to be explored in fisheries by recognising narratives of lived experiences of loss and damage. Addressing this gap can provide nuances, new insights that can enrich ways of knowing to minimise and address those.

Thus, gaps and tensions exist in framing loss and damage, between one technical framing of the subject and one that is constructed based on the lived experiences of those affected. These tensions give rise to critical issues of justice and equity, such as (i) recognising impacted people's experiences, knowledges and values; (ii) reflecting on who bears the cost of and benefits from support mechanisms; (iii) including relevant actors in decisions-making processes related to loss and damage; and (iv) recognising and addressing injustices associated with loss and damage over time.

The traditional nomenclature of international global policy is typically framed in dichotomous terms, such as Annex I/Annex II, Global South/Global North, and "developed/developing". These terms fail to account for non-sovereign territories and subnational regions within Annex I countries (e.g., Greenland and French overseas territories) that are characterised by colonial legacies; socio-economic inequities; a high level of biodiversity; and minimal historical responsibility for emissions, yet acute vulnerability to climate change (Ferdinand 2018; Deane, 2023; Deane and Dutta, 2024; Nowatzke, 2024). Indeed, these issues are rendered invisible by prevailing assumptions relating to development and stability. Given these gaps, this thesis critically engages with and problematises loss and damage, as seen through the lived experiences of those who are impacted. In this way, the thesis seeks to contribute to more just and contextually grounded alternatives, advancing

conceptualisation, measurement, and decision-making processes that can minimise and address loss and damage.

From top-down visions to lived experiences of climate change loss and damage in tropical fisheries

Given the current debates and limitations in framing and governing loss and damage, shifting the focus to lived experiences allows for a deeper exploration of what counts as loss and damage, for who, and in which ways, as well as the drivers of loss and damage.

The impact of climate change on fisheries, particularly in tropical areas, is not a distant threat but an urgent issue that demands immediate attention (IPCC, 2019; Lam et al., 2020; Sumaila, 2022a; Xu et al., 2024). The slow-onset events of climate change, such as rising sea temperatures and ocean acidification, are already affecting marine and coastal ecosystems, leading to a shift in species abundance and distribution across the globe (IPCC 2019; Lam et al., 2020; Sumaila, 2022a; Xu et al., 2024). For instance, the adaptation limits of coral reefs are mentioned in the IPCC (2019). Climate change impacts are particularly severe in tropical areas, where many communities depend on small-scale fisheries for their livelihoods, food security, and well-being (IPCC, 2019; Lam et al., 2020). Future projections indicate that by 2100, sea surface temperature will increase by 0.8 ± 0.3 °C under IPCC Representative Concentration Pathway (RCP) 2.6 scenarios, and by 2.9 ± 0.6 °C under 51 RCP 8.5, compared to the 1986–2005 period (IPCC 2019 see SPM3(abc)).[5]

The thesis focuses on the overlooked context of fisheries. Although fisheries is one of the sectors that is most impacted by climate change, discussions of loss and damage in fisheries have only started to take place relatively recently (FAO, 2023). To date, climate change is not well integrated into fisheries policies, and vice-versa, leading to adaptation initiatives being inadequate to respond to climate change events (Fogarty et al., 2021; Sumby et al., 2021; Xu et al., 2024). Yet warming sea temperatures, marine heat waves, sea level rise and ocean acidification are often reported as drivers of marine and coastal environmental loss (IPCC 2019; Sumaila, 2022a; van der Geest and van der Berg, 2021). At the international level, the Ocean and Climate Dialogue in 2020 was the first initiative to discuss loss and damage and

[5] RCP2.6: One pathway where radiative forcing peaks at approximately 3 W m–2 before 2100 and then declines (the corresponding ECP assumes constant emissions after 2100). RCP8.5: One high pathway for which radiative forcing reaches greater than 8.5 W m–2 by 2100 and continues to rise for some amount of time (the corresponding ECP assumes constant emissions after 2100 and constant concentrations after 2250 (IPCC, 2013, p. 1461).

fisheries jointly (Dobush et al. 2022; Laffoley et al. 2022). The Wim ExCom was recognised as an important institutional mechanism for fostering synergies between the ocean and climate communities, thus indicating the importance of increasing knowledge of loss and damage in ocean and fisheries (Dobush et al. 2022). This was reinforced in 2023, by the Food and Agriculture Organization (FAO) of the United Nations' first publication on loss and damage in agrifood systems. Nonetheless, to date, no specific fisheries and ocean framework addresses climate change (Spalding and Mckinley, 2025). Science and policy acknowledge the inherent challenges of working in fisheries, particularly small-scale fisheries, as there is a lack of available and accurate data in the sector.

This thesis focuses on loss and damage in the context of small-scale fisheries. Although these fisheries sustain the livelihoods and food security of billions globally, they remain structurally marginalised in national and international ocean governance (Saunders et al., 2016; Arias-Schreiber et al., 2022; Chuenpagdee et al., 2022; Österblom, H.et al.2023; Santha, 2023; Blythe et al., 2024; Basurto et al., 2025). Small-scale fisheries are diverse and there is no consistent definition of them but the term can be taken to refer to pre-harvest, near-shore harvest, and post-harvest activities involving low-technology, low-capital, labour-intensive practices (Smith et al., 2019; Basurto et al., 2025). The introduction of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries (FAO, 2012) was a notable attempt to advance equity and justice in the sector; however, small-scale fishers continue to be largely excluded from policy frameworks and climate-related decision-making processes (Jentoft, 2014; Arias Schreiber et al., 2022; Blythe et al., 2024; Basurto et al., 2025). This exclusion is often explained by their limited production compared to industrial fishing or aquaculture, even though they account for approximately 40% (37.3 million tonnes) of global fisheries catches (Basurto et al., 2025).

The concept of "Blue Justice", which is rooted in ideas of social justice, was introduced at the Third World Small-Scale Fisheries Congress in Thailand in 2018. Thereafter, it was picked up by scholars researching the marginalisation and exclusion of coastal people in ocean-related discussions and has been referred to in studies that emphasise the critical role of small-scale fishers in ocean sustainability (Isaacs, 2019; Bennett et al, 2021; Crosman et al., 2022; Jentoft, 2022; Blythe et al., 2024; Santha, 2024).

Many actors with different interests and values are embedded within the same seascapes. To this extent, while the valuation of fisheries has traditionally applied market values (e.g. utility, preference) (Jonhson, 2018; Sumaila, 2022b), fisheries scholars recognise the need to understand better the range of values within fisheries, beyond their market dimensions (Ginkel, 2009; Jonhson, 2018; Allison et al., 2020; Sumaila, 2022b; de la Puente, 2022). Additionally, multiple climatic and non-climate stressors (e.g. overexploitation, pollution, invasive species and habitat loss)

are not necessarily observable to everyone (Barange et al., 2018; Sumaila et al., 2022a; FAO, 2023). In the absence of further consideration of these issues, any attempt to minimise and address loss and damage in fisheries will lead to unsuccessful, if not detrimental, impacts on people.

This thesis focuses on loss and damage from the perspective of lived experiences, considering the subjective nature of fisheries and the knowledges embedded in specific social and ecological contexts. In doing so, I seek to provide deeper insights into the meaning and drivers of loss and damage. Furthermore, looking at loss and damage from everyday perspectives, where nature and humans are inextricably linked and embedded in socio-ecological processes, is at the heart of this thesis. The lack of focus on linking loss and lived experiences in fisheries (Adams et al., 2020; Ramenzoni et al., 2020; Woodhead et al., 2020; Gianelli et al., 2021) reflects the general theoretical gaps in loss and damage research. By addressing this oversight with regard to empirical understandings of the nature and extent of loss and damage associated with climate change challenges in the fisheries sector, the thesis supports efforts to minimise and to address effectively and equitably, such loss and damage, both in fisheries R and beyond, through both policy and practice (Mechler et al., 2019; Boyd et al., 2021; IPCC, 2022; UNEP, 2023).

Aim and research questions

My thesis aims to analyse and explore the framing, lived experiences, and governance of loss and damage in tropical fisheries associated with climate change, focusing on how these issues are understood and addressed from a bottom-up perspective. The objective is to empirically examine and understand loss and damage in fisheries through actors' interpretations, experiences, and interactions, and to explore the implications for developing inclusive governance strategies for managing loss and damage in the fisheries sector. This objective is pursued through a review of scientific evidence (Paper I), an empirical study in Martinique (France) (Papers II and III), and the conceptualisation of both non-empirical and empirical evidence (Paper IV). This research aims to address the following overarching question:

How is loss and damage framed, experienced, and governed in tropical fisheries?

Three sub-questions address this overarching research question:

RQ1: How is loss and damage framed in the context of tropical fisheries?
RQ2: How is loss and damage situated in fishers' everyday lives? What are the significant processes (social, political, or economic) that interplay and are associated with loss and damage?
RQ3: How do diverse knowledges and processes shape the governance of loss and damage in fisheries?

These questions are explored in four research papers, which are included in the annex of the Kappa and introduced in the following sub-section.

Overview of papers

The following table provides an overview of the research papers and the main research questions (RQs) they address (Table 1).

Table 1: Overview of papers and the main research questions (RQs) addressed by them

Papers / Research questions	I	II	III	IV
RQ1: How is loss and damage framed in the context of tropical fisheries?				
RQ2: How is loss and damage situated in fishers' everyday lives? What are the significant processes (social, political, or economic) that interplay and are associated with loss and damage?				
RQ3: How do diverse knowledges and processes shape the governance of loss and damage in fisheries?				

Paper I, *Loss and damage in tropical fisheries: A systematic review of people, climate, and fisheries,* examines in a systematic review of interdisciplinary literature how loss and damage is reflected upon and evidenced in tropical fisheries, with an emphasis on values and drivers.

Paper II, *Loss and damage in fisheries: Building on fishers' situated knowledge to inform ways of knowing,* is an empirical analysis of how fishers' situated and subjective knowledge of socio-ecological changes in the context of Martinique can inform a broader understanding of loss and damage in tropical fisheries.

Paper III, *Loss and Damage in fisheries: (In)tangible, Ambiguous, and Disenfranchised,* is an empirical paper that critically examines how fisheries actors (fisher and practitioners) in Martinique experience and understand loss and damage and demonstrate overlooked forms of loss (specifically, tangible/intangible; non-finite and ambiguous loss; and disenfranchised grief), and their implications for justice and equity.

Paper IV, *An equity framework for governing loss and damage in fisheries: Why do we need to conceptualise equity in loss and damage and for whom?* presents a novel, comprehensive and multidimensional framework for integrating equity considerations into decision-making processes aimed at minimising and addressing loss and damage associated with climate change in tropical fisheries. The paper draws on subjective interpretations based on experiences, and decision-making options available to address loss and damage. The paper provides key principles for consideration in fisheries loss and damage that can be scaled up and applied to other contexts.

Scope of analysis

This thesis is situated within the field of sustainability science, which is a science that aims to make *"the normative concept of sustainability operational"* (Spangenberg, 2011, p. 276) and to develop theories that *"transcend individual cases but still confine themselves to particular contexts"* (Clark and Harley, 2020, p. 340). In the context of loss and damage, the divergent understanding of what is loss, and for whom, further complexifies the contours of the notion of sustainability that is to be operationalised. Situating this thesis within sustainability science implies a knowledge that is normatively grounded in equity and justice, and oriented towards addressing complex socio-ecological challenges associated with loss and damage in fisheries, which threaten the livelihoods, way of life and well-being of fishery people.

I explore loss and damage in fisheries as a case of critically situated knowledge, bounded by an empirical focus on everyday lived experiences of loss and damage in Martinique (France) fisheries (see Figure 1). The analytical focus is two-fold, focusing on (i) hegemonic framings of loss and damage in fisheries (e.g. economic valuation, scientific measurement, etc) (Paper I) and (ii) the context (Paper II, Paper III) in which the lived experiences of loss and damage are situated (the socio-political, environmental, and historical realities of Martinique). A key motivation for the focus on context (Paper II, Paper III) is that the nature of loss and damage means there is a need to investigate those parts of everyday life that intersect with climate change, and how climate change dispossesses people of things they value as meaningful (Morrissey & Oliver-Smith, 2013; Barnett et al., 2016; Serdeczny et al., 2016; Henrique et al., 2022; Boyd et al., 2023; Van Schie et al., 2023). The study site is the everyday seascape (including both the coastal land areas and the sea itself) occupied by local fishers. The focus on this site alone aims to promote a better understanding of loss and damage in fisheries and meaning-making in context. For instance, very few studies examine the impacts of the loss of ecosystem services (as a non-economic form of loss and damage) on other forms of loss and damage, be it

conceptually or empirically (van der Geest et al., 2019; Janzen et al., 2021; Bhowmik et al., 2024). For small-scale fishers, whose everyday livelihoods and well-being are closely tied to the health of the ecosystem in which they live and work, such losses have profound implications, including potential adaptation limits. Adaptation limits also remain largely underexplored in fisheries research and policy (Galappaththi et al., 2022).

What counts as loss and damage in fisheries also relates to the geographies of loss and damage (see Figure 1). Where we study loss and damage will influence how governance shapes framing, experiences and policies relating to loss and damage, and how we address questions of justice and equity for those who are most impacted, from recognising them to including them in decision-making processes, to alleviating and restoring what has been harmed (Paper IV). Empirical evidence of loss and damage often focuses on countries that are termed "developing." However, evidence of loss and damage is global (Boyd et al., 2021), and there remains a lack of scholarly attention on some territories, such as the overseas territories[6] of France (Ferdinand, 2018; Ferraro et al., 2023).

France has the largest maritime area in the EU, estimated at more than 10 million km2 (OFB, 2024). France's overseas territories account for 10% of the coral reefs in the world, 80% of the country's biodiversity, and 97% of its maritime economic zone (OFB, 2024). In summary, climate impacts on French territories have some critical implications for marine biodiversity and people relying on them, across all oceans. However, following the release of the latest French National Adaptation Plan (PNACC3), the French High Council on Climate (HCC) (2025 p. 17) has underscored that France has yet to consider *"adaptation limits of people, ecosystems, territories, and livelihoods sectors, as well as loss and damage, and social vulnerability"* (author's translation).

The Caribbean region is significantly impacted by climate change, with climate events such as coral bleaching, warming temperatures, extreme events, and sea level rise. Given those impacts, the main objective of the action plan of the Caribbean Regional Fisheries Mechanism (CRFM) member states is the management of loss and damage (CRFM, 2020).

[6] Overseas territories are under legislative identity (or legislative assimilation) (Article 73 of the French Constitution (Constitution Francaise, 1958)), meaning that laws and regulations apply automatically in those territories with possible adaptation for their specificities under conditions (see French Constitution, art73 al.2, al3. (Constitution Francaise, 1958)).

This thesis focuses on Martinique, France's smallest overseas territory and an EU outermost territory[7] that is located in the Caribbean arc. Governed from 7,000 km across the Atlantic Ocean, Martinique presents a unique and complex case, as regards the following: (i) assumptions about experiences of loss and damage in fisheries, not bounded by the Annex I/non-Annex I divide but having regard to the historical and socio-ecological importance of fisheries; (ii) socio-ecological drivers of loss and damage at the subnational level, which are often overlooked in climate and fisheries science and policy; (iii) a multilayered governance context in relation to loss and damage, shaped by subnational (Martinique) national (France), supranational (EU), and international (e.g. UNFCCC) frameworks complexifying integration of local forms of knowledges, experiences and context-specific solutions into climate and fisheries policies (iv) patterns of inequity and injustice associated with loss and damage from climate change.

Martinique does not contribute significantly to climate change, within France or globally, but it faces similar historical, socio-economic, and environmental challenges as surrounding SIDS. Despite calls within France and beyond for the recognition of their specific realities and needs as regards the impacts of climate change (Sage et al., 2015), there is limited attention in the literature on the Caribbean Lesser Antilles (Nguyen and Robinson, 2019; Baptiste and Robinson, 2023) and particularly on the climatic and socio-ecological realities of France's overseas territories (Malcom, 2018; Dean, 2023; Ferraro et al. 2023, Deane and Dutta, 2024). As per the Common Fisheries Policy (CFP), established in 1983, the EU exercises certain competencies relating to Martinique's fisheries (e.g. management, conservation of marine resources, vessels). The Treaty on the Functioning of the European Union (TFEU) refers to, in article 349, the need for specific measures for EU outermost regions, such as Martinique, given their "structural social and economic situation", which is compounded by "their remoteness, insularity, small size, difficult topography and climate, economic dependence", which "[restrains] their development" in fisheries (TFEU, 2012 p. 195). Only 1% of the marine coastal ecosystem services in Martinique are considered to be in a very good condition (Failler et al., 2015). The island's fisheries are predominantly small-scale and have been steadily declining in recent years. Due to environmental contamination, a fisheries ban has been imposed on approximately 30% of the coast, and the island has been categorised as a environmental "sacrifice zone" by the UN Special Envoy (United Nations, 2022).

[7] The EU's outermost territories are part of the EU; therefore the laws, rights and duties of the EU apply to those territories (France: Guadeloupe, French Guiana, Martinique, Réunion, Saint-Barthélemy, Saint-Martin; Portugal: the Azores, Madeira; Spain: the Canary Islands)

With the link between historically socioeconomically unequal societies and biodiversity loss being evidenced in the literature (IPBES, 2019; Pickering et al., 2022), loss and damage will potentially worsen social injustice and inequalities within Martinique. Thus, as summarised by Ferdinand (2020, p. 127): *"Not small island states yet not identical to the other diverse regions and departments of European France, the French Outre-mer*[8] *are still looking for adequate means of confronting climate change within the existing national and international institutions."*

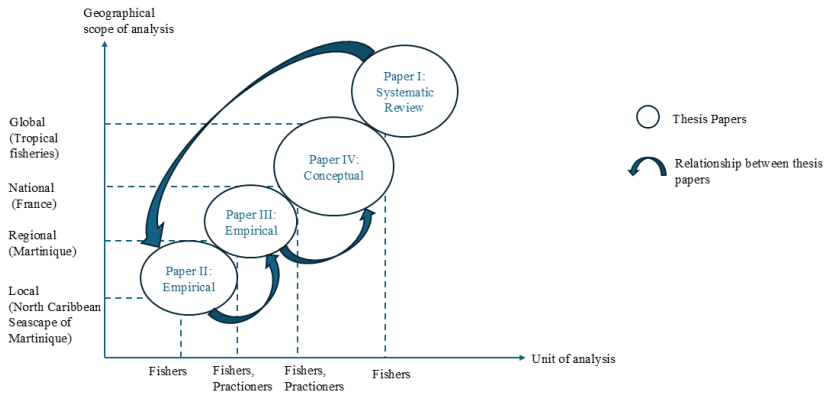

Figure 1. Relationship between geographical scope and unit of analysis across the thesis papers

The following section introduces a conceptual framework that critically engages with the dominant framings of loss and damage. Using a justice-oriented lens, this framework emphasises the lived experiences of loss and damage in fisheries, with the aim of arriving at a more just and equitable understanding of loss and damage in the context of climate change. Adapted from Brink 2018.

[8] *Outre-mer* (French) can be translated as "overseas".

Conceptual framework

Introduction to the conceptual framework

The purpose of the conceptual framework is to bound the research theoretically. Epistemologically, I situate this thesis within a nuanced framework of critical constructivism that takes account of the complexity and contextual nature of knowledge on loss and damage in fisheries. I conduct the analysis through applying a Blue Justice lens, as positioned within this broader theoretical approach. While critical constructivism focuses on understanding how knowledge about loss and damage is socially constructed and context-dependent, a Blue Justice lens brings a more context-specific and action-oriented focus on just and sustainable outcomes that recognise and meaningfully engage with fisheries' actors. The thesis theorises loss and damage in fisheries through considering the following: (i) Subjective interpretations of impacts and sensemaking (e.g. values and emotions, resources, identity), reflecting the hermeneutics of loss and damage (precisely, its interpretation, meaning, and contextual understanding). (ii) Experiential accounts, specifically the understanding of lived and personal experiences of loss and damage, where the social, cultural, political, environmental and economic background is considered as shaping experiences and narratives of loss and damage. (iii) Social interactions between actors in fisheries, and how these interactions construct the meaning of loss and damage in context.

The following sub-section situates, historically and theoretically, the literature on loss and damage relating to justice and equity. Thereafter, the following sections present the theoretical positions and concepts referred to and applied in the thesis.

Historical and theoretical context

I begin by contextualising loss and damage within the existing literature and conceptual paradigms relating to justice and equity. While there exists no specific framework for loss and damage, various approaches in the limited body of studies (non-exhaustively cited here) examine loss and damage through the lens of justice and equity, extending beyond the sole focus on capturing and addressing economic

loss (e.g. Boyd et al., 2021; Robinson and Carlson, 2021; Dorkenoo et al., 2022; Huber et al., 2024). Common to these approaches is the recognition that structural inequity exacerbates the risk of disproportionate loss, with loss and damage linked to failures in mitigation and adaptation. The literature highlights the critical role of the historical socio-political context in shaping loss and damage, mediated by actors and decisions. For instance, Jackson and colleagues (2023) apply a Foucauldian governmentalities approach to explain the challenges in, and opportunities for, addressing loss and damage. Vanhala and Hestbaeck (2016), as well as Vanhala (2023) and Johansson et al. (2022), applied an international relations constructivist perspective to empirically examine how ideas, norms, and discourse have shaped international negotiations and the policy development of Loss and Damage. Perry (2020), Robinson and Carlson (2021), and Johnson et al. (2023), amongst others, emphasise the role of historical socio-ecological drivers that are rooted in the legacy of colonisation in shaping not only the outcomes of climate impacts, as loss and damage, but also the power dynamics in climate policies. To link local realities of loss and damage with their structural barriers, Dorkenoo (2024) combined different theories, in the context of land loss and access issues in Cambodia. From a more ethical and epistemological level, Serdeczny et al., (2016) advanced theoretical perspectives on values in non-economic loss and damage through an applied philosophy approach. Toussaint and Blanco (2020) and McNamara et al. (2023) connected loss and damage to human rights. Similarly, some authors have contributed to centring loss and damage as human well-being issues (e.g. Ayeb-Karlsson et al., 2023; Ayeb-Karlsson et al., 2024). The diversity of justice and equity-related approaches reveals the challenges in defining and operationalising loss and damage.

Based on my reading of the different strands of the framework on loss and damage cited here, and beyond, I find gaps in the current loss and damage literature. First, there is a paucity of linkages between loss and damage and fisheries contexts in the literature, reflecting gaps in the understanding of the nature and extent of loss and damage (e.g. what counts as loss, who is affected, why it occurs, how it manifests, and where it is occurring). The absence, in the literature, of experiences in fisheries—which affect millions of people worldwide, mainly in tropical areas with high vulnerability levels—indicates a critical need for research linked to epistemic injustice, in order to develop just, equitable and context-relevant solutions. The current literature that is available also focuses mainly on institutions and finance issues, and on the Annex I/non-Annex I divide, with few studies on the subnational context, particularly non-sovereign territories, in the Caribbean and Lesser Antilles. Thus, situating my research within the literature on loss and damage, and engaging with justice and equity, I use a bottom-up approach to contribute to developing diverse ways of framing loss and damage. By providing additional insights, nuances, and complexities, my research aims to contribute to the empirical evidence to support the development of effective strategies for addressing loss and damage.

My research connects loss and damage to the fisheries and ocean literature, as well as English and French scholarship relating to those topics, and to tropical islands scholarship.

Theoretical foundations

I use critical constructivism as the meta-theoretical framework to guide the construction of the research.. The choice of this approach is justified by the contested space in which loss and damage is located, and by the "constructive ambiguity" that characterises the concept in science and policy (Vanhala and Hestbaek, 2016; Vanhala, 2023). The choice aligns with the thesis's objective of understanding loss and damage through uncovering subjective experiences, interpretations, and interactions in a given context, and how this shape how loss and damage is addressed.

Indeed, critical constructivists, at the core, consider that knowledge is shaped within specific historical, socio-cultural, economic, and political contexts in which interactions occur (Weldes et al., 1999; Nissinen, 2001; Macleod, 2004). By recognising and revealing imbalances in whose narratives are recognised and included, a critical constructivist approach seeks to critically reflect and deconstruct biases and assumptions embedded in dominant narratives, while advocating for the inclusion of marginalised forms of knowledge. For instance, Gholiagha (2015) emphasises that even after after an agreement is reached between two or more parties, the meaning evolves as interactions occur. Critical constructivism seeks to employ scientific analytical tools to support inclusivity and the recognition of alternative views in decision-making and knowledge production by acknowledging that interpretations and knowledges are situated. This approach aligns closely with feminist and postcolonial thought (Longino, 1999; Bee et al., 2015; Abimbola, 2021; Nightingale et al., 2020; Dutta and Das., 2023; Cummings et al., 2023). Thus, using critical constructivism as a meta-theory creates space for an interdisciplinary framework that integrates diverse forms of knowledge, while employing scientific analytical.

In line with my application of this meta-theory, I consider loss and damage to be a socially constructed and negotiated concept, one that is continuously shaped through interactions. This is notably reflected by engaging with the "constructive ambiguity" of loss and damage.

"Constructive ambiguity" of loss and damage

As a matter of social justice in climate change policy and science, recognising lived experiences of loss and damage is central in discussions and debates on the governance, measurement, and conceptualisation of loss and damage. Constructive ambiguity has been discussed in international negotiations of loss and damage (Vanhala and Hestbaek, 2016; Vanhala, 2023). The concept refers to a situation where vagueness and imprecision are accepted in order to allow discussion to continue amid contested issues. However, while helpful in promoting advanced negotiations (see Vanhala, 2016), I believe that the constructive ambiguity surrounding the concept of loss and damage invites a critical interrogation of justice and equity, particularly concerning actions to minimise and address loss and damage for those who are most affected. This reinforces the need to deconstruct dominant framings and assumptions, based on people's lived experiences.

First, throughout this thesis, I reflect on this constructive ambiguity through applying a critical constructivism lens, as I believe that this constructive ambiguity raises critical questions of justice and equity, regarding whose framing and narratives are recognised, legitimised, and institutionalised, and whose are marginalised or absent. Loss and damage is shaped by normative debates and discussions amongst competing actors in climate policy (e.g. Parties, scientists, practitioners, and justice movement) (Boyd et al., 2021; van der Geest and Warner, 2020; Kraal et al., 2023; Benjamin and Thomas, 2023). Vanhala (2023), notes that since 2008, given the opposition between a risk-based framing (e.g. about disaster risk management approaches (Annex I countries)) and a harm/justice-based framing (e.g. about liability and compensation (non-Annex I countries)) of loss and damage, a more ambiguous framing of loss and damage, considered as constructive, has taken over and is currently shaping institutional resources and orientations. The constructive ambiguity of this framing is considered as such as it allows discussions to proceed, leaving contentious topics (e.g. liability, attribution and drivers of loss and damage) unaddressed.

Second, I believe that constructive ambiguity opens reflections on critical questions of justice and equity, regarding recognising the nature and extent of loss and damage to people and society. For instance, while the term loss and damage is present in the WIM, the UNFCCC categorisation of loss and damage employs economic and non-economic loss and omits the damage component. In contrast, loss and damage scientists and practitioners, as is the case in this thesis, commonly integrate damage, which implies the possibility of acting upon, restoring or repairing the impacted elements (Amini et al., 2023; van Shie et al., 2023). Thus, loss and damage is both retrospective, regarding impacts that have occurred (Amini et al., 2023), and prospective, regarding impacts that are inevitable or cannot be avoided (Walters et

al., in preparation). In addition, scholars have emphasised the "thousand ways" (Tschakert, 2019)—if not potentially "infinite" ways—of knowing and experiencing loss and damage, both in different contexts and over time (Boyd et al., 2021). Within this frame of constructive ambiguity, vagueness can complicate the recognition and measurement of lived experiences of loss and damage, as it often deflects engagement with contentious issues of justice.

Overall, constructive ambiguities seem to be present across global climate policy. The Paris Agreement preamble emphasises the importance of ecological systems, such as the ocean, as well as "*the importance for some of the concept of 'climate justice'*". Yet the meaning of climate justice remains unclear and open to interpretation in the context of climate change policy (Okereke and Coventry, 2016, Kraal, 2023). Equity is more commonly used than justice in international agreements and policy to refer to geographical participation, inclusion, and *"level of development*", as it appears to be less broad, and more specific than universal (Will and Manger-Nestler, 2021; Pickering, 2022). It remains the case that limited attention is given in climate science to the differentiation between justice and equity, and both are often used interchangeably or synonymously (Chalifour, 2021; Will and Manger-Nestler, 2021; Pickering, 2022). In this thesis, I do not aim to clearly delimit them: rather, I integrate key principles of each regarding loss and damage in fisheries. Indeed, while justice and equity are increasingly acknowledged in climate policy, their connection with loss and damage and ocean-related issues remains limited and underexplored.

Hence, in this thesis, critical constructivism is used to reflect on the interplay between local and global narratives by deconstructing how subjectivities and knowledge shaped by historical, cultural, and social contexts emerge from lived experiences of loss and damage in fisheries. I frame loss and damage through lived realities, and as a context-dependent, relational, and dynamic concept that is shaped and reshaped through socio-ecological interactions over time. Specifically, I look at loss and damage across time, be it how it came to be (past), the current situation (present), and what it is and what it implies (future) in people's everyday lives. Such information is critical to advance the social justice dimensions embedded in loss and damage and to inform the governance of fisheries. Building on this, my examination of justice and equity in the fisheries sector provides a targeted application of the critical constructivist meta-theory in loss and damage, as seen through a Blue Justice lens, by engaging with situated experiences of loss and damage in fisheries.

Integrating a Blue Justice lens

Critical constructivism is a broad framework that is used to bound the research and to provide insights and understanding in regard to how loss and damage is constructed and shaped by competing knowledges, experiences, values, and interests. However, to deepen the focus of the analysis and to bring a more practical, justice-oriented approach to the context of oceans and fisheries, I apply Blue Justice as a lens. Loss and damage is widely recognised as a critical social justice issue. In the context of marine and fisheries, the concept of "Blue Justice" specifically addresses these concerns, making it a particularly appropriate choice of lens in this thesis. This contrasts with other critical social justice frameworks, such as climate justice, which primarily engage with global climate policy and emissions reduction, rather than the specific socio-ecological dynamics and justice concerns in the marine and fisheries context. Blythe et al. (2024, p. 3) provide a working definition of Blue Justice: *"The recognition, meaningful involvement, and fair treatment of all coastal people with respect to how ocean and coastal resources are accessed, used, managed and enjoyed. Drawing upon the environmental justice movement, this definition recognizes the inherent right of all people and communities to a healthy, productive, and sustainable marine environment."*

Blue Justice is thus normative, involving principles of justice, equity, and inclusivity, which in this thesis are supported by insights from critical constructivism. The Blue Justice lens emphasises both the social and ecological dimensions of loss and damage, which is particularly relevant as it has been demonstrated that the multidimensional nature of small-scale fisheries touches upon various critical sustainable development themes (Basurto et al., 2025).

In 2018, the concept of Blue Justice was brought into the academic arena by Isaac (2019), in a context in which discussion of the blue economy was gaining central attention, over equity and justice considerations, in marine governance for small-scale fisheries. Scholars use the concept of Blue Justice to emphasise the need for the recognition and inclusion of small-scale fishers, who are "too big to ignore" (e.g. Too Big To Ignore Global Partnership for Small-Scale Fisheries Research) in ocean-related discussions (Isaacs, 2019; Jentoft & Chuenpagdee, 2022; Bennett et al., 2023; Blythe et al., 2024). Current research using Blue Justice extends from environmental justice (e.g. recognition, procedures, and distribution) (Bennett et al., 2021) to food sovereignty and epistemic justice (Arias Schreiber et al., 2022; Chuenpadgee et al., 2022; Polejack et al., 2025), and research in the context of climate change (Hardy et al., 2017; Mills, 2018; Ertör, 2021; Bennett, 2023; Santha, 2024).

This scholarship builds on a wealth of knowledge on issues of justice in small-scale fisheries (Blythe et al., 2024). However, Bennett et al. (2025) emphasised the lack of data on social equity matters in ocean and sustainability frameworks. There is also a need to enrich Blue Justice empirically, based on people's experiences and conceptualisation (Jentoft & Chuenpagdee, 2022). While loss and damage has not yet been analysed through a Blue Justice lens, Arias Schreiber et al. (2022, p. 7) underscore the fact that existing concepts developed outside the scope of small-scale fisheries can be introduced to Blue Justice.

Blue Justice as process and principles

Blue Justice is a social process that is multidimensional and relational, encompassing both tangible and intangible dimensions across different scales of analysis and over time (Jentoft, 2022; Arias Schreiber et al., 2022; Blythe et al., 2024, p. 6). Indeed, the Blue Justice lens highlights the crucial importance of ecological, social, cultural, and ethical dimensions for a sustainable marine environment and pays particular attention to the dimension of sustainability (e.g. social, environmental and economic). I use the Blue Justice lens to emphasise and integrate alternative ways of knowing, values, worldviews, and epistemologies constructed in fisheries realities (Arias Schreiber et al., 2022; Santha, 2024), which might not align with what counts as loss and damage in dominant discourses. As Bennett et al. (2025) emphasised, justice and equity are matters of philosophical positions and socio-cultural differentiation in different contexts. Additionally, Bercht et al. (2021) indicate how ocean justice perspectives facilitate epistemological and ontological dialogue, while promoting normative and justice-oriented discussions in academia and beyond.

The idea of Blue Justice draws on lived experiences of harms affecting small-scale fishers and coastal people to provide empirical insights into those harms and their drivers, shedding light on issues such as lack of recognition, inequitable treatment, and absence of tools and resources (e.g. vocabularies) for participating in decision-making processes (Arias-Schreiber et al., 2022; Chuenpagdee et al., 2022; Blythe et al., 2024). Hence, giving space to narratives regarding lived experiences can play a critical role in contributing to reframing and reshaping dominant narratives, moving towards a more nuanced and inclusive discourse (Arias Schreiber et al., 2022; Jentoft, 2022; Santha, 2024). Scholars emphasise the marine social sciences' critical role in bringing these experiences into science and policy (Bennett, 2019; Arias Schreiber et al., 2022; Paterlow et al., 2023; Spalding and McKinley, 2025).

Building on this scholarship, and drawing insights from critical constructivism, this thesis takes a bottom-up approach that supports a context-specific analysis of loss and damage, and which contributes to justice-oriented perspectives in addressing loss and damage. Thus, this thesis draws on Blue Justice to focus on lived

experiences in fisheries and to identify patterns of blue injustice and inequities in the recognition and meaningful involvement of those experiences in decision-making processes relating to fisheries. By focusing on bottom-up experiences, knowledges, and values (as detailed below), I seek to deconstruct and reconstruct the understanding of loss and damage, in order to contribute to more just and inclusive fisheries governance, while informing broader approaches to ocean governance and climate policy.

Key concepts of the framework

This section defines and discusses the foundational concepts of the thesis, under the critical constructivism framework. The concepts chosen aim to situate the research in a situated fisheries context where different experiences, interpretations, and interactions take place. The concepts chosen are the following: (i) Situated knowledges, which highlight the importance of contextual experiences in shaping knowledge. (ii) Values that underscore what of significance has been impacted, and in which ways they have been impacted, and how this is associated with climate change. (iii) Hermeneutical (in)justice, seen through the Blue Justice lens, revealing gaps in ensuring localised experiences are understood and recognised in decision-making process.

Situated knowledges

The understanding of ways of knowing loss and damage in context and through experiences is thus critical to this research. I therefore draw on the concept of situated knowledges developed by the feminist scholar Donna Haraway (Papers II, III, IV). As the "s" at the end of knowledges hints, the idea of situated knowledges implies a plurality of valid knowledges, all being different because all are situated in a particular context (including that of the researcher). Indeed, the concept pays particular attention to the context in which a problem is discovered and considers people's experiences as knowledge (Harraway, 1988; Santagata and Yeh, 2016; Dutta and Das, 2023). This concept aligns with a critical constructivist approach since it acknowledges that subjectivity is multidimensional and constantly constructs itself because of its context dependencies (e.g. history, social, cultural, economic and political). The idea of situated knowledges thus shifts the focus from "universal" and "objective" knowledge to recognising the partial, contextual, and embodied nature of all knowledge. Additionally, the idea of situated knowledges aims to bring different ways of knowing, different values, and interests (particularly knowledge that is locally situated and often marginalised) to the definition of the problem, for a richer and more nuanced understanding (Janack, 1997; Hooks, 2000). Such knowledge is, therefore, not apolitical or neutral and recognises the different

and competing epistemologies and values people hold. The idea of situated knowledges acknowledges that knowledges are relational, and that inclusivity enriches the understanding by bringing alternative views to dominant narratives. The concept of situated knowledges has been used in climate research theoretically and empirically to shed light on mismatches between local realities and dominant discourses in climate change (Dutta and Das, 2023; Porcuna-Ferrer et al., 2023; Reyes-Garcia et al., 2024).

Values

Within the frame of the theoretical approach chosen, I consider values as situated and shaped by context, and interactions within it, as knowledges are. Situated knowledge is thus instrumental in understanding what is valuable to people and how these values are associated with climate change impacts, such as loss and damage. Situated knowledges helps uncover what people care about (value) and in which ways and informs us about what and why these things are considered as losses and damages. The recognition and inclusion of diverse values and knowledges, particularly of those who are marginalised, contributes to alternative views of the meaning ascribed to loss and damage. I draw on environmental values (e.g. instrumental, intrinsic, and relational) to understand biodiversity loss to people and its associated loss and damage (Paper I). Values are also present implicitly in all of the papers, by revealing what has been impacted, be it economic, cultural, social, or ecological, and what might be a meaningful and profound loss and damage in fisheries.

Hermeneutical (in)justice

Finally, I reflect on the constructive ambiguity surrounding loss and damage as regards whether interpretive resources are available to make sense of and recognise experiences of loss and damage in fisheries (Paper III, IV). I use the concept of hermeneutical injustice, developed by Fricker (2007). This refers to a situation in which a gap in interpretative resources (e.g. tools, technical language, or concepts available to make sense of lived experiences) leads to a gap in understanding those experiences. This occurs when concepts fail to adequately capture the experiences of marginalised or less recognised groups, leading to non-nuanced and inadequate narratives, with unfair consequences (Fricker, 2007; Arias Schreiber et al., 2022; Cummings et al., 2023). The concept of hermeneutical injustice relates to situated knowledges and values, by exploring the plural ways of knowing and valuing within the dominant framing which occurs due a lack of agreed terminology. Hermeneutical injustice fits into the broader dimension of epistemic injustice, which Arias Schreiber et al. (2022, p. 2) describe in the context of small-scale fisheries as blue hermeneutical injustice, i.e. *"harm to small-scale fisheries people in their capacity as knowers."* Chuenpagdee et al., (2022) consider this concept central in

achieving Blue Justice. I apply the concept of hermeneutical injustice to understand experiences of loss and damage in fisheries and to identify where gaps lie in the framing of loss and damage, which is subject to many ambiguities in its conceptualisation, measurement, and governance. In parallel, the concept of hermeneutical injustice reveals where challenges lie, which can help us to ensure there is a recognition of situated knowledges and values in loss and damage, and to emphasise recognition, dialogue, and empathy. Hermeneutical (in)justice allows for creating spaces for an inclusive and interpretative framework that considers ways of knowing and valuing.

In summary, the combination of these concepts highlights how some forms of knowledges and values are misunderstood, if not absent or excluded, due to gaps in dominant interpretive frameworks (figure 2). I use these concepts to examine the framing and experiences of loss and damage, with a focus on the differences, commonalities, gaps, and challenges associated with a justice-oriented governance of loss and damage. More precisely, this is a governance where the knowledges and experiences of those impacted are recognised, understood, and valued, and are meaningfully included in decision-making processes. Furthermore, these concepts encourage dialogue with other forms of knowledge, opening space for interdisciplinarity and the development of inclusive and context-specific understanding and strategies to address loss and damage.

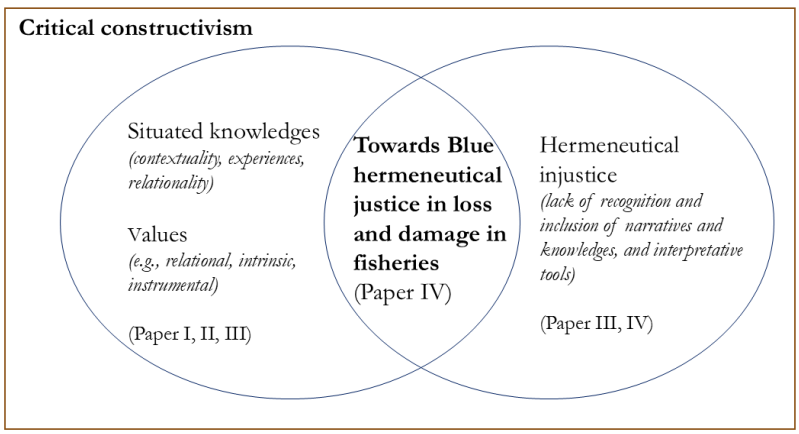

Figure 2: Key concepts of the framework
This figure illustrates the intersection of situated knowledges and values, which inform the lived experiences of loss and damage, intersecting with hermeneutical injustice. This intersection provides critical insights for the recognition and inclusion of narratives from lived experiences in marine and coastal contexts, specifically fisheries.

Synthesis and implications

In summary, the thesis's framework involves the use of critical constructivism and a Blue Justice lens to examine how loss and damage are contextually constructed. It aims to deconstruct the dominant framing of these issues and to reconstruct a more equitable understanding. This process is informed by situated knowledges and values and the concept of hermeneutical injustice. The Blue Justice lens is practically oriented, enabling us to recognise and meaningfully involve small-scale fisheries actors in the decision-making process on loss and damage. The framework and the lens emphasise the relational construction of loss and damage through socio-ecological interactions (e.g. economic, social, cultural), and make inclusivity and equity central issues. Thus, I explore loss and damage as outcomes of climate change that intersect with non-climatic drivers (e.g., socio-economic, political, cultural, environmental) and shape loss and damage in fisheries. I pay attention to the challenges of recognising and involving everyday knowledges, experiences, and values in discussions on loss and damage, so as to provide insights that support inclusive governance that can sustain fisheries in the face of loss and damage.

Methods and materials

This section presents the methodology underpinning this research. This methodology is consistent with the thesis's overarching aim and its conceptual orientation of foregrounding bottom-up perspectives through experiences, knowledges, and values in the context of loss and damage. The section begins by providing a rationale for the choice of qualitative methods and then presents the case study in which these methods were applied, as well as the data collection and analysis strategies. Finally, I conclude by reflecting critically on my positionality and the methodological limitations of this research.

Qualitative approach

The research is rooted in a comprehensive, qualitative method that aims to understand the how and why (Dumez, 2011 p. 56) of lived experiences of loss and damage, and their recognition and meaningful involvement in decision-making processes. More precisely, the thesis's main research question seeks to uncover "how" loss and damage is framed, experienced, and governed, by drawing on fisheries actors' realities. Guided by a critical constructivist approach, the research interprets perceptions, values, meaning, interactions, and relationalities occurring in the fisheries context. Hence, through its use of qualitative methods, the thesis does not seek to produce generalisable or directly comparable findings; rather, it aims to generate context-rich, in-depth understandings that reflect the situated and diverse experiences of loss and damage within fisheries. A qualitative method is also suited in contexts that are characterised by unknowns and limited data availability (Gerring, 2017; Alexander et al., 2020)—in this case, respectively, about loss and damage, small-scale fisheries, and our geographical analysis.

Anchoring this research in a case study is thus particularly useful given the research aims and conceptual approaches. As Glaser et al. (2023 p. 3) state, *"case studies are useful in answering the 'how and why' questions in complex situations where the boundaries between a focal issue and its context are often unclear."* The need for qualitative methods in climate and ocean research has been raised as critical for greater context relevance, effectiveness and to ensure decisions are accepted in

different contexts (Bennett, 2019; Bavinck and Verrips, 2020; White et al., 2021; Mckinley et al., 2022; Paterlow et al., 2023; Spalding and McKinley, 2025). This thesis departs from the framing of loss and damage in the literature (Paper I), moving to the lived experiences of loss and damage in a case study (Paper II, Paper III), in order to inform the development of a conceptual equity framework for governing loss and damage in fisheries (Paper IV). The next section presents the case study rationale and selection.

Case study

In the context of ocean sustainability research, a case study is an in-depth exploration of particular processes, which is carried out in order to examine *"ideas, interpretations, and perspectives"* so as to gain *"detailed, fine-grained, multifactorial insights"* for contextual understanding (Glaser et al., 2023). In my thesis, the case study is situated in a real-world fisheries setting and focuses on loss and damage associated with climate change. I use an embedded single case study, commonly defined as a case that includes several units of analysis focusing on specific aspects relevant to the research (Scholz and Tietje, 2002; Yin, 2009). This choice is made to gain a more profound and nuanced understanding of loss and damage in fisheries through multiple perspectives in a case where socio-ecological processes take place and interact with climate change impacts.

Martinique is a region of the Republic of France located in the Antilles Arc between the Caribbean Sea and the Atlantic Ocean. Following a period of slavery and colonisation, the island became officially part of France in 1946. The island is the overseas territory of France that has the highest GDP per inhabitant and it has the highest standard of living in the Caribbean. It is estimated that 394,173 people (0.6% of the French population) live on the island and that the density is 354 inhabitants per km² (vs 116.5 on the mainland). The island suffers from critical historical socio-economic challenges, coupled with increased climate change impacts. For instance, Martinique has been exposed to 22 cyclones (with an increase in intensity) since 1995 (Assemblée National, 2024), the most recent being Beryl in June 2024, which severely impacted the fisheries sector (Lamy, 2024).

In 2024, a French Parliament report on risk in overseas territories indicated that, while these territories are often subject to climate events, risk management plans do not integrate climate change impacts and socio-economic data relating to those impacts (Assemblée Nationale, 2024). This is consistent with the analyses and recommendations of the High Council on Climate in France (HCC) (2023 p. 4), which underscored France's high vulnerability to climate change, and the need to

shift from a reactive approach to a more proactive one. The same Council, in the light of the 2025 National Adaptation Plan to Climate Change (PNACC3) (third version) pinpointed gaps in (i) considering ex-ante social vulnerability, and the reduction of climate change impacts on livelihoods and poverty, (ii) connecting climate policy with biodiversity, and (iii) aligning with the European Adaptation Strategy recommendations on integrating just transition and nature-based solutions.

Support related to climate events in Martinique is available mainly in post-disaster contexts, and relies on a declaration of a state of emergency, from the overseas to the national level. Such a state of emergency is declared subject to ministerial approval and based on national weather forecast evidence showing the exceptional intensity of the event. The main available funds are the following: (i) The *Fonds de secours pour l'Outre-Mer* (Overseas Emergency Relief Fund) (FSOM) for individual, artisanal businesses, and local authorities. The fund support is destined for economic loss (materials, infrastructure). (ii) The *Fonds d'aide au relogement d'urgence* (FARU) (Emergency Housing Assistance Fund), which is a support for emergency housing assistance. (iii) The *Fonds de secours d'êxtreme urgence* (Extreme Emergency Relief fund) (FSEU), for emergency support, such as first aid necessities. Private insurance coverage in overseas territories within those sectors is almost non-existent (Sénat, 2019).

The relationship between Martinique and France can be considered as complex, as illustrated by Ferdinand et al., (2020, p. 61) in regard to climate governance and beyond: *"Pragmatic benefit and hence 'true equality'*[9] *represents one dimension of that struggle, while greater cultural autonomy and respect for local cultures grounded in a delicate colonial history represent the other. This indeed is what we observe from Greenland to Martinique.*" (Ferdinand et al., 2020 p. 61). Within France, Martinique has sought to enhance its political autonomy from the mainland and to gain recognition of its cultural and historical specificities, shaped by the legacy of slavery and colonialism, alongside its distinct socio-political, environmental, and economic realities within the French context (Daniel, 2019; Ferdinand, 2020;Daniel, 2022; Monat, 2025). This is notably reflected in diverse social and environmental movements demanding institutional reforms that account for the island's identity and needs, and the impacts of historical legacies. This was illustrated recently in mobilisations around chlordecone contamination (Ferdinand, 2015; Christensen, 2023) and the cost of living (Constant, 2024). Within this context of historical socio-economic, political, and environmental challenges, fisheries actors must navigate the growing impacts of climate change.

[9] This expression refers to the Loi égalité réelle (Law of True Equality) (n° 2017-256 February 2017), which stipulates recognition of the right to real equality within France of the populations of the overseas territories, as well as their right to a context-relevant sustainable development model to achieve equality while respecting national unity.

Context of Martinique fisheries

Martinique fisheries are predominantly small-scale (97.3%) (Direction de la Mer, 2024). In France, this means that fishers spend less than a day per fishing trip . It is also estimated that boats are usually smaller than 12 metres in length. The fisheries of Martinique are predominantly artisanal, multi-species, and multi-gear (see Paper II). These fisheries have been inherited from previous generations of fishers who, from the period of slavery onwards, blended African, Caribbean, and European cultural influences to adapt to the island's biophysical and environmental realities, thereby developing diverse practices and techniques to sustain, first and foremost, their communities (Dubost, 1996). All fishers have undergone maritime training (e.g. navigation) through dedicated institutions that provide a mandatory certificate for the practice of maritime activities. Despite its socio-cultural importance, local fish production is insufficient to cover local needs, accounting for only 15.7% of local seafood consumption, the rest being imported (Direction de la Mer 2024).

Fishers operate within a Marine Park established in 2017, covering the whole Exclusive Economic Zone (48 900 km²). A total of 526 fishers are currently involved in fisheries (Direction de la Mer, 2024), a significant decline compared to the 1,080 fishers recorded in 2014 (Mazurek et al., 2019). Indeed, fishers face several socio-ecological challenges, including being limited to fishing in only approximately 30% of their geographical seascape due to chlordecone contamination (Figure 3). Since 2010, sargassum bloom has had detrimental impacts on fisheries and coastal populations from the Caribbean to the Atlantic, including Martinique.

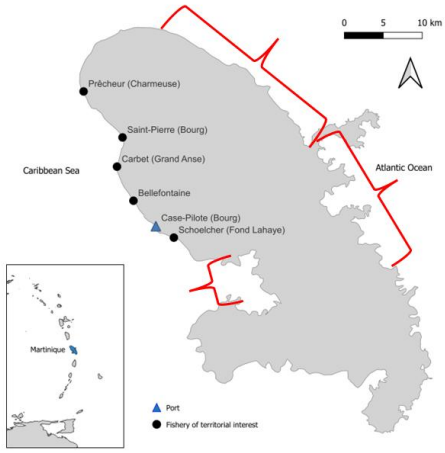

Figure 3. Map of zones where fishing is forbidden
The figure illustrates the localisation of zones (see red areas) where fishing is forbidden, due to chlordecone contamination. Map created by Murray Scown, adapted by the author.

Martinique fisheries operate within a complex, multilayered system of governance, as overseas territories and EU outermost regions. Thus, fishers fall under the EU Common Fisheries Policy (CFF), and national and regional structures. This challenging coordination between the different levels leads to tension: to give one example, regarding Martinique's adaptive multi-species fishing practices, versus the single-species management that prevails within the EU. There is a lack of consistent and comprehensive data on Martinique multi-species fisheries, which challenges, for instance, the access for the funding for the renewal of fishing fleets based on specific reporting standards (eg., biological, environmental, technical and socioeconomic data see The Fisheries Data Collection Framework (DCF)). France's latest National Adaptation Plan (see PNACC3, 2025) recognises the need to improve scientific knowledge for sustainable fisheries and the ocean, with an emphasis on data on stock, activities diversification, and aquaculture development.

The study of loss and damage in fisheries in Martinique is of particular relevance as it offers a critical lens for exploring the lived experiences of loss and damage. There is currently no implementation, plan, or framework (though there are some preliminary reflections) that connects climate change and fisheries in Martinique, and data are not consistently collected (data collection takes place based on fishers' voluntary will). Finally, the institutional layers across levels of governance, respectively for fisheries, climate change, and biodiversity, from Martinique to the supranational level, underscore a critical need to explore lived experiences of loss

and damage in fisheries, and knowledges derived from those experiences, in order to develop context-relevant and equitable decisions.

Study location: North Caribbean Region of Martinique

In 2022, I undertook (from the end of April to May) an exploratory mission to understand the context surrounding fisheries in Martinique. I started by meeting fishers and then met institutional actors in fisheries. I was able to identify key challenges and processes in fisheries. Following the first mission, I developed a project that would be scientifically interesting and particularly relevant for Martinique fisheries, informed by rich exchanges on critical matters in the context of climate change by all actors. For feasibility, I decided to situate the fieldwork study in the North Caribbean region of the island (Figure 4). The second mission (May–June 2023) was focused on data collection. My research took place during what is considered the low season. This period was recommended by fishers and practitioners during the scoping phase, as it offered better accessibility and the potential for richer insights. Indeed, the low season is typically less productive, so those present at sites are predominantly full-time fishers, with constant interactions with fisheries and seascapes. Finally, I embarked on preliminary dissemination activities, based on preliminary results (online November 2024), before a final dissemination mission following completion of the PhD thesis.

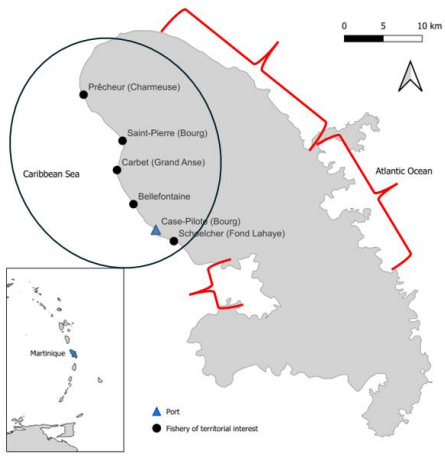

Figure 4: Case study sites
The figure illustrates (approximately) the localisation of the case study sites in Martinique. Map created by Murray Scown, adapted by the author.

The main port of the Caribbean coast of Martinique, Case-Pilote, is in the North Caribbean region; other localities are mainly landing sites. This region is prone to extreme events, such as Cyclone Beryl, which mostly impacted north Caribbean fishers, and slow-onset events, such as sea level rise, (future relocation plans for le Prêcheur have already started to be implemented). In contrast to the Atlantic side of the island, fishery bans are not in place here, which made the research more feasible. Additionally, the impacts of sargassum bloom are less marked: given the movement of tides and the depth of the sea near the shore, there is rarely a massive landing on the beach. The north Caribbean is also mainly rural, and is considered to be the poorest part of the island, with one-third of inhabitants under the poverty threshold per consumption unit (€1,041) (INSEEE, 2020).

Data collection

Across this study, primary data (data collected by the researcher) and secondary data (data not collected by the researcher) were both collected through different methods (e.g. systematic review, case study, conceptual analysis) (Table 2).

Table 2: Data collection methods for each thesis paper (I–IV)

Papers	Method
Paper I	Systematic review Thematic analysis
Paper II	Empirical case study and qualitative methods Thematic analysis
Paper III	Empirical case study and qualitative methods Thematic narratives analysis
Paper IV	Qualitative methods primary and secondary data Thematic analysis

Paper I: Review paper

In Paper I, I conduct a systematic review, looking systematically at interdisciplinary literature on climate, biodiversity loss, and people in tropical fisheries. Secondary data were extracted from SCOPUS and Web of Science and systematically assessed and reviewed before data extraction.

Paper II and III: Empirical papers

To realise the empirical papers, my preliminary steps, such as sampling strategies, recruitment, and data collection tools, are presented below.

- Sampling strategy

In qualitative methods, sampling is carried out with regard to the context of the research problem and the conceptual orientation. Thus, sampling is not about generalising to a population but about relevance for providing insightful knowledges about the problem (Savoie-Zajc, 2007, p.100; Ndayizamba, 2015, p. 88). I used non-probability sampling techniques, for reasons of convenience, as well as snowball sampling amongst fishers and practitioners operating in the North Caribbean seascape. This sampling is particularly suited to qualitative research in cases in which little information is available on a topic (Marshall, 1996).

Fishers, due to the proximity of their localities, all share the same marine space and environment; it was, for instance, common to meet fishers from another locality at one landing site. The fluidity of fishers' livelihoods and their ways of life, which are tied to the sea, made this sampling ideal. I focused on fishers that fish daily in the north Caribbean seascape (see Paper II for details on fishers). Given the aim of this research, it was important to include in the sample fishers who have continuous interactions with the sea. I used the same sampling for practitioners (Paper III), selecting them based on the criteria of having related relevant activities with fisheries in the north Caribbean region, be it regarding marine and coastal biodiversity, socio-economic matters of fisheries, or water environment. The choice to diversify the sampling with different actors was made to enhance the transferability of the results (Marshall, 1996), by providing a wider range of perspectives and delving deeper into the complexity of loss and damage in fisheries in the context of Martinique.

- Recruitment and ethical considerations

The recruitment of fishers took place mainly in the port, on landing sites, or in the market. In each case, in the first meeting, I presented them with the ethics consent forms (setting out the research objective, process, advantages and disadvantages, confidentiality, and asking if they wished to be contacted in the future). The research received ethical approval from the Swedish National Ethics Authority (Ref. DN-03670-01). Most fishers agreed to participate directly, while some waited two to three days before doing so, depending on their availability and the time needed to build trust. This last point was partly due to existing tensions regarding, and criticisms of, scientists within the sector, who are perceived as contributing to the development of policies that are not adapted to their realities (Thiriot et al., 2020). All fishers gave their consent to participate in the research. Before the interviews, I pre-tested my checklist of questions, particularly regarding the language used, with

fishers living close to my accommodation in the South Caribbean. The recruitment for interviews stopped when saturation was reached because recurrent meaning and themes were coming through. In regard to practitioners, I reached out by email and telephone to institutions and non-governmental organisations relating to socio-economic aspects of fisheries, biodiversity, and water management with links to the north Caribbean region. All interviews were conducted on site, except one that occurred online at a later date.

- Data collection tools

Different data collection tools were used (Table 3) across the empirical papers, with the aim of gaining insights relating to the main research question.

Table 3: Data collection tools and respondents

Tools / Participants	Semi-structured interviews	Focus groups	Go-along	Visual representation of the typology of losses in policy
Fishers	20/26	15/26	10/26	26/26
Practitioners	5/11	6/11	NA	11/11

The use of these different tools was made based on considerations of convenience and feasibility, on site, but first and foremost to reduce biases. Each tool allowed me to delve deeper into specific dimensions of loss and damage, as described below for each respective paper.

In Paper II, I focus on fishers' ways of knowing. Using different research tools was convenient for adapting to the fishers' rhythms in their seascapes. Indeed, the hours spent at sea and the work needed on the ground make it difficult for fishers to sit and talk, and thus required *"fitting in around the 'rhythms' of fishing"* (Guvtasson, 2020 p. 49).

I recruited 26 fishers of which 20 agreed to participate in semi-structured interviews. Semi-structured interviews were particularly important to delve deeper into some specific pre-defined themes, while having flexibility to adapt to fishers' answers. This method was chosen to enable in-depth understanding and to elicit nuance in the set of responses and patterns across fishers' experiences. This method was also preferred by some fishers to focus groups, which was consistent with what I heard on my first visit, regarding the reluctance among some fishers to discuss individual matters, considered as personal, in a group.

Focus groups were used to gain collective views and insights relating to the research topic. This tool was selected given the significant lack of data around the topic, and additionally, the well-documented shifting baseline, and the subjectivity and multifaced nature, of loss and damage. In total, 15 fishers participated in focus groups. The focus groups allowed me to gain rich interactive information based on the experiences, knowledges, reflections, and opinions shared. Importantly, focus groups were useful for seeing how actors shaped their responses during interactions with peers in similar seascapes.

To gain a broader view of the surroundings (sea, coastline, town, market interactions, boat/bus journeys, port, landing site interactions, and meetings), I undertook participant observations. This was particularly helpful for gaining information on fishers' relationships, which shape their daily experiences and knowledges gained over time. These observations occurred at different times of the day, when no interviews or focus groups were booked with fishers.

The go-along method, as described by Kusenbach (2003), is suitable for subjective research as it aims to *"capture the stream of perceptions, emotions, and interpretations"* (p. 464), which made it ideal for breaking any initial hesitancy between the fishers and myself. I conducted go-along with 10 fishers. This approach allowed me to engage with them in their daily activities in space and time—such as landing fish, emptying boats, and preparing nets—without the rigidity of a formal interview. By integrating both interviews and observations, the go-along method also enabled me to document verbal exchanges and unspoken interactions in fishers' seascapes, providing information on the elements that comprise their daily lives, place-based knowledge, and socio-cultural and political matters. Go-along is designed to capture activities conducted by informants in their context, thus providing insight into their lived experiences and interpretations (Kusenbach, 2033; Barlett, 2023).

I used a visualisation on the typology of losses (Figure 5) by the UNFCCC, which categorises pre-defined loss and damage. This visualisation was useful for opening up a discussion regarding the hegemonic global framing and lived realities with all fishers and practitioners. Visualisation tools support discussions by providing more tangible elements, and different perspectives and ways of knowing (Henrique et al., 2022). The visualisation tool was presented at the end of each interview to participants, who were asked to reflect on its adequacy regarding local perceptions and experiences of loss and damage. The tool was particularly useful to explore what people value in loss and damage, but also to discuss drivers of, and past, present, and future perspectives on, loss and damage.

Figure 5: Typology of loss by the UNFCCC.
This figure represent the component of economic and non-economic losses by the UNFCCC (Source: UNFCCC)

Paper III builds on Paper II. However, it additionally integrates practitioners' views and enriches the understanding of lived experiences of loss and grief in time and space. Amongst the 11 key practitioners in Martinique, 5 participated in semi-structured interviews. In total, 6 practitioners have participated in focus groups.

Paper IV: Conceptual paper

Paper IV uses materials from previous papers (primary and secondary data) and advances conceptual understandings of loss and damage, in regard to its equity dimension. The paper builds on Paper II and Paper III (empirical papers) to derive patterns of equity and then draws on the conceptual equity framework in ocean and fisheries to propose an equity governance framework of loss and damage in fisheries.

Data analysis

I used thematic analysis, which focuses on patterns of meaning: more precisely, the themes that are the most salient in the dataset (Braun and Clarke, 2006; Joffe, 2011). Thematic analysis is considered particularly suited for understanding and interpreting the construction and deconstruction of the object of studies through different perspectives and experiences (Joffe, 2011; Alhojailan, 2012). Thematic analysis is rooted in context analysis (quantitative), which focuses on frequencies and decontextualisation. However, it additionally integrates tacit and implicit meanings, and code connected continuously to the dataset (Namey et al., 2008). Thematic analysis can be carried out on various support materials, such as interviews and focus groups, but it can also be carried out on images (e.g., visualisation tools) (Joffe, 2011; Neuendorf, 2018). Themes in thematic analysis can be explicit (e.g. direct mentions of the problem) or implicit (e.g. references) (Guest et al., 2008; Joffe, 2011). Thus, this type of analysis was suited to my quest to understand framings and experiences of loss and damage in fisheries. In my research, I have used a dual deductive-inductive approach. I used the preconceived categories of loss and damage associated with climate change. However, I also used

methodological tools that allowed for the inclusion of new concepts and knowledge emerging from my empirical dataset.

I transcribed the data, which involved translation primarily from French to English, and occasionally from Creole to French before then translating into English. This process was supported by field notes and audio recordings to ensure accuracy and the retention of contextual meaning and nuances. I used NVivo software to systematically organise and analyse the data, identifying emerging themes through a process of coding and thematic categorisation. This facilitated the recontextualisation of the data while maintaining analytical coherence, ensuring thematic validity and consistency throughout the analysis. However, while the data were organised into NVivo, I had to proceed manually as I needed to have a broader view and to reconnect the data with the hand notes taken during my analysis. Since themes evolve during data analysis, staying grounded in the research problem and considering overlapping themes was necessary. Indeed, as explained by Welsh (2002 p. 6):

> "The software is the loom that facilitates the knitting together of the tapestry, but the loom cannot determine the final picture on the tapestry. It can though, through its advanced technology, speed up the process of producing the tapestry and it may also limit the weaver's errors, but for the weaver to succeed in making the tapestry she or he needs to have an overview of what she or he is trying to produce."

Data were coded and grouped into broad themes, such as loss and damage, climate events, drivers, and demographic information. Later, temporal elements and emotional elements were added. I iteratively reviewed the data to ensure that my themes were relevant and consistent across participants' contextual realities.

As noted previously, I drew on several sources to gain a more comprehensive insight of loss and damage, and I cross-checked emerging patterns, be they commonalities, differences, or variations. Indeed, given the subjectivity of the topics, triangulation—using multiple methods, actors, and disciplines—has strengthened the depth, validity, and reliability of the findings. As Haraway (1988) underscores, knowledge is not innocent or neutral but situated, i.e. knowledge is subjective and context-dependent. Thus, data triangulation has been particularly valuable in my research. By combining different viewpoints, ways of knowing, and experiences of loss and damage, I uncovered patterns—of similitudes, contradictions, and nuances—that are crucial for supporting the equitable governance of loss and damage.

The thesis also takes place in the context of two interdisciplinary projects: Marine Coastal Ecosystems Biodiversity and Services in a Changing World (MACOBIOS)

and Recasting the Disproportionated Impacts of Climate Extremes (DICE). I have also worked with peers from different disciplines (in Papers I, II, and III) which further supported the reduction of my own biases, influenced by my positionality.

Research positionality

The Coelacanth *(Latimeria chalumnae*) is a pre-historic fish that is the emblem of the Comoros islands, due to its resilience and its adaptability to change and time. This fish holds, first and foremost, a symbolic, cultural, and existential meaning; it cannot be traded in any market. It was in the Comoros islands that my interest in exploring loss and damage in fisheries grew. There, fishers not only work to sustain their livelihoods and food security, they are also guardians of the Coelacanth. I have thus been embedded since a young age in seeing fisheries as not solely an economic activity, but a culture. The ocean shapes the way of life and the identity of people from Comoros. We are therefore dependent on the ocean, expressing itself slowly but surely—and sometimes extremely. This unstable object leads us to constantly reshape what we are, what we know, and how we adapt.

As a SIDS citizen, I was first brought to talk about loss and damage in conferences in 2017. In 2019, Cyclone Kenneth hit Comoros. Working in an international development organisation, I took part in an assessment of the agriculture and fisheries sector. I was therefore confronted with the challenge of measuring loss and damage using specific indicators, while accounting for the multiplicity of impacts that were reported to us. Knowledge of context and culture indicated to me the necessity of having context-specific ways of understanding loss and damage, given the critical role of those assessments in supporting those affected. These past experiences in the field gave me practical tools to use in my fieldwork strategy, both before fieldwork and on site, such as building trust and empathy in relation to fishers and the need to adapt to the contextual realities, tools, and approaches. Additionally, I am French (mainland) and Ivorian. My academic background was shaped by the French education system, until I went overseas to French Canada for my university studies in economics and politics (BA) and agricultural economics (MSc). Hence, my academic knowledge was gained predominantly in Western countries, while in my private life I grew up with different ways of knowing. I also had the opportunity to undertake an online part-time internship at the Loss and Damage Unit of UNFCCC in 2022, which gave me a better understanding of the practical challenges and needs surrounding empirical knowledges on non-economic loss.

The rich multicultural context I was born into made me quickly realise what Chimamanda Ngozi Adichie (2009) addressed in her "The Danger of a Single Story". Specifically, how a single story on a topic can emphasise *"how we are*

different, rather than how we are similar". Simply put, stories matter, as they help avoid oversimplification, stereotypes, and misconceptions, which is particularly important for me as I have often been exposed to a homogenisation of *"overseas territories*" in media, and discourses , despite the rich socio-ecological and cultural diversity across these territories. My background and experiences, or as Harraway (1988) would describe, my situated knowledge, have thus influenced this thesis, from the themes to the research design, to my interpretation of the field.

When I visited and explored Martinique, particularly the North Caribbean region, I was struck by some biophysical similarities with the Comoros. Simultaneously, I had a broad understanding of the institutional and administrative context surrounding Martinique (France). Culturally, Martinique's West African heritage is still vibrant and pronounced. In other words, I found that Martinique, while being distant, has elements of my own background. Informal discussions in daily interactions (on public transport, and in shops, markets, and libraries) were particularly helpful in immersing myself in daily life. In regard to addressing my situated knowledge, I quickly understood the critical importance of triangulating data. I also reviewed my data each day, to reflect on my reactions and understanding (to see whether they emerged (or not) from the data, thus creating biases in theme construction). Meeting some informants several times during the fieldwork was also one way I overcame any bias. Importantly, I continuously reconnected with the research gaps and questions, to ensure that my interpretation remained grounded in the data and represented participants' perspectives.

Limitations

Method

In qualitative research, we aim to explain a phenomenon. Such research is therefore more about knowledge transferability than generalisation (Savoie-Zajc, 2007, p. 100). In this regard, the thesis's findings offer transferable insights and contextual elements that are not generalisable. For instance, qualitative systematic reviews, such as that presented in Paper I, may not yield generalisable conclusions (Wutich et al., 2024). However, as illustrated in Paper I, the findings provide insights and support the understanding of the state of the art in the literature on loss and damage in tropical fisheries. In terms of the thesis's limitations: a mixed methods approach could have enhanced the generalisability of the study by drawing from this qualitative study offering insights of lived experiences of loss and damage and then identifying broader patterns, such as climate impacts and their consequences in

Martinique or the Caribbean region, or EU outermost tropical small-scales fisheries. However, combining these different methods raises critical reflections on not diluting or simplifying insights from those impacted, which must remain central in loss and damage science and policy.

Recruitment

As per the thesis's focus, this thesis focuses on the lived experiences of those practising in fisheries. Given the contextual realities, women's perspectives among the fishers are missing. The women I encountered during my fieldwork were involved in trading were limited. Their presence was not continuous, given the low catches that occurred at that time. My sample only includes fishers who practise full-time. Interviews with those who have exited the sector could have provided deeper insights into the impacts of climate change. However, it is extremely difficult to know who is active in practising fisheries, as being a fisher is not always a regular practice and does not always have an administrative basis. The masculinisation of the fisheries sector can notably be traced back to slavery and the colonial period. However, as emphasised by feminist studies, male-dominated groups are also important, as they are also subject to inequity and marginalisation (Knott & Gustavsson, 2022). Pauwelussen (2022), for instance, emphasised the ecological embeddedness and situated vulnerabilities of male fishers, connecting coral reef loss, loss of fishes, and the damaged bodies of male drivers. Future studies could further enrich understanding of the gender perceptions within these groups.

Data collection

The study could have been enriched by integrating other locations on the island. For instance, the North Atlantic side of Martinique is under a significant fisheries ban. Research in those locations could have enriched the understanding of loss and damage associated with climate change in a context in which environmental pollution occurs. In addition, I conducted my interviews during the low season for fisheries. Future study could be enriched by conducting interviews and observations in the high season. While it might be more challenging to interact with fishers in this season, it would make it possible to access different perceptions across different periods for fisheries.

Access to different parts of Martinique is very challenging outside of the capital due to the absence and irregularity of public transport. This reduced the hours I could spend daily in the field. Martinique is a complex context, with many different layers of institutions, which presented challenges in regard to comprehending all information or elements relating to decision-making.

Data analysis

Given my positionality, I acknowledge that my interpretations are influenced by my own situated knowledge. In addition, some interview text needed to be translated, particularly from Creole to French to English, and some deeper meaning may have been lost in this process. Thematic analysis is flexible in identifying those patterns that are the most significant in the data. However, if the goal is to develop a theory from the data and to explore social-ecological processes over time, grounded theory may be more suitable, making it possible to delve deeper. However, grounded theory has also its own complexity. The go-along method was a rich one, but it was challenging to listen to recordings, due to the sound interference, from the sound of the sea to motors and background voices. I used the Audacity software to remove background noise.

Applicability to other regions

Using qualitative methods, this study does not aim for generalisation. Martinique is a complex case (e.g. due to its historical, governance, socio-economic, biophysical, environmental, and climatic context) that cannot be generalised to other French overseas territories or EU outermost regions. However, this thesis provides critical insights that can enrich the understanding of the nuances of loss and damage in fisheries, and that can provide relevant general lessons on critical considerations when conceptualising, measuring, and governing loss and damage in fisheries: first and foremost, considering socio-political, cultural, economic, and biophysical differences. Future studies could enrich this research by comparing the Caribbean and Atlantic side of Martinique and by conducting research in other overseas territories.

Findings and discussions

This section introduces and discusses the findings around the framing of loss and damage in fisheries, the situated experiences, and the implications for governing loss and damage in fisheries. The first section critically examines the framing of loss and damage (RQ1) through the qualitative insights gathered from fisheries actors, and by relating these lived experiences to science and policy . Then, drawing on this framing, the following sections reflect on the situatedness in space and time of loss and damage and associated processes in fishers' everyday life (RQ2). Finally, the analysis critically examines how varied knowledge shapes and challenges the governance of loss and damage in fisheries (RQ3).

Framing loss and damage in fisheries

This section presents and discusses findings relating to the framing of loss and damage in tropical fisheries (RQ1), through an examination of the literature (Paper I) and empirical evidence (Paper II, III) in Martinique. It compares the policy framing with lived experiences on the nature of loss and damage, applying critical constructivism meta-theory, and a Blue Justice lens, with an emphasis on knowledge systems and values.

The findings indicate a significant divergence between the dominant framing of loss and damage in policy and the framing of loss and damage within the lived experiences in fisheries. As reported in the literature, the policy framing underscores technical narratives driven by what can be measured, counted, and monetarily valued, leading to an emphasis on economic loss and damages (Boyd et al., 2021; Jackson et al., 2023) in the fisheries sector (FAO, 2023). In contrast, the systematic reviews (Paper I) and the empirical papers (Papers II and III), through the qualitative data, show that loss and damage is predominantly framed as more than economic/non-economic, and encompasses several dimensions (Figure 6) As one fisher underscored, when looking at the visual typology of loss and damage I presented to him: *"The others' loss and damage are very important for us too."* (Paper II).

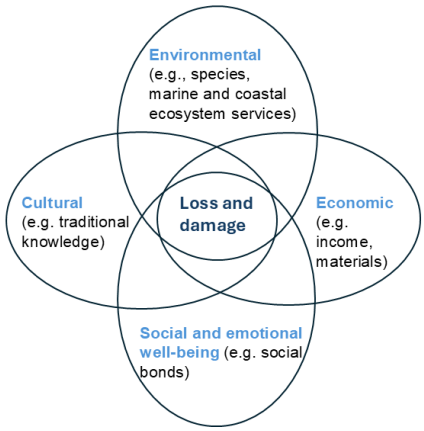

Figure 6: A multidimensional framing of loss and damage
This figure represents the dimensions of loss and damage as framed by fishers, highlighting its multifaceted nature.

The findings underscore that environmental loss and damage has the most impact in fishers' everyday lives, as the fisheries depend on marine and coastal biodiversity (e.g. species, marine and coastal ecosystem services) (Papers I, II, and III). Paper I purposively emphasises biodiversity as a non-economic form of loss and damage, and analyses environmental values (e.g. intrinsic, instrumental and relational). While Paper I reveals the predominance of environmental values in the literature, the paper demonstrates that biodiversity loss has cross-cutting impacts that are associated with social and emotional well-being and culture (e.g. identity, belonging, emotional dimensions). The illustration of the impact of the loss of flying fish on other loss and damage is particularly indicative of the relationality within loss and damage (Papers II, III). As one fisher underscored: "*Everything is linked. If you say economic loss, I answer you family: how to sustain them and be there. If the family is impacted, we lose our mind."* (Paper II). The findings also underscore that loss and damage is framed as multifaceted by fisheries actors, as it can be either tangible or intangible in regard to the context in which it is reflected upon (Papers I, II, III, IV). This point is underscored in the general literature on loss and damage (Morrissey & Oliver-Smith, 2013; Barnett et al., 2016; Serdeczny et al., 2016; Boyd et al., 2021; Henrique et al., 2022; Van Schie et al., 2023).

Consistent with the literature, fishers report extreme events, such as cyclones, are increasing in intensity (IPCC, 2019; Lam et al., 2020; Xu et al., 2024). However, the findings reveal that both extreme and slow events affect fishers simultaneously, but that slow-onset events (e.g. a change in seasonality and sea temperature) are

more significant over time to fishery people as they occur continuously (Papers I, II, III, IV). Nonetheless, lived experiences underscore that climate change impacts are interrelated with other elements that intersect in fishers' lives to shape the outcomes of loss and damage (Papers I, II, III). For instance, biodiversity loss is first and foremost addressed in regard to environmental pollution, due to land-sea pollution, to which climate change adds pressure (Papers I, II, III,). Everyday perspectives also emphasise the continuous impact of unaddressed historical socio-environmental issues: for instance, years of polluting activities, and socio-economic inequities that limit adaptation within seascapes. This suggests that loss and damage in fisheries has historical structural systemic causes that need to be uncovered as it is perceived to be the result of the continuation of historical injustices. This aligns with postcolonial Caribbean climate justice literature, which calls for an epistemological and ontological shift in how we understand and respond to climate change—beginning from the places where its impacts are most deeply felt (Ferdinand, 2020; Baptiste and Robinson, 2023).

There are thus two different framings: that of current policy and that of lived experiences. On one hand, policy exhibits an acontextual and depoliticised framing. This is delimitated in the literature as a neoliberal and market-based solutions-oriented framing, emphasising risk reduction approaches and addressing symptoms rather than root causes (Abimbola, 2021; Jackson et al., 2023; Santha et al., 2024). In contrast, lived experiences of loss and damage in Martinique reveal a place-based knowledge that is deeply connected to fishers' relationship with the sea and fisheries across generations. This is further underscored by one fisher's quote: "*Fishing is our existence; the sea is our existence"* (Paper II). Consistent with Thiriot et al.'s (2017) study on north Caribbean environmental knowledge, fishers root their understanding and framing in traditional knowledge transmitted through storytelling, observations of movements (e.g. of species, winds, birds, the moon) and external forms of knowledge (e.g. scientific, technical, popular media) (Paper II, III). Knott and Gustavsson (2022) have notably emphasised the ecological embeddedness of fishers, with evidence that increasing ecological degradation is affecting fishers' health. The finding reveals that loss and damage is deeply connected to seascapes and that dichotomies such as biodiversity loss and ecosystem services are seen as inadequate, as they might separate what cannot be separated (Papers II, III). As one fisher stated: *"if biodiversity is gone, the sea is dead and fisheries with it, everything goes together."* Fishers' knowledge is thus an adaptive knowledge that is relevant to their realities. This implies the critical importance of understanding what relationships people have with the ocean, as is emphasised in the marine social sciences literature (Ingersoll, 2016; George & Wiebe, 2020; Pauwelussen and Lau, 2023), but here precisely for loss and damage, and indicates the need to open up climate science to marine social sciences and beyond. The Blue Justice lens contributed to this research by linking both, and highlighting the critical justice and equity gap. This relates implicitly to the growing body of ocean literature that emphasises the need to reframe the ocean as more than a resource, as it has

traditionally been framed in policy (Ingersoll, 2016; George & Wiebe, 2023; Pauwelussen and Lau, 2023).

Indeed, the current framing of loss and damage is too narrow and limited to address loss and damage in tropical fisheries, specifically in the context of Martinique. While the framing captured here relates back to Boyd et al.'s (2021) typology of existential framing, versus more technocratic framing in climate policy, or Vanhala's (2023) risk framing versus justice-oriented framing, the Blue Justice lens enriches a justice-oriented approach to loss and damage. Bottom-up approaches in fisheries settings not only reveal alternative ways of framing loss and damage, particularly from those experiencing it, but also show the critical need for framing from lived experiences in loss and damage in fisheries. The focus on fisheries actors has revealed that loss and damage is framed as having a multidimensional and multifaceted nature, with potentially "infinite values" (Boyd et al., 2021). The "constructive ambiguity", leaving open contentious questions, raises additional critical issues of equity. Framing loss and damage as biophysical impacts contrasts with a framing that interrelates a multiplicity of drivers relating to different forms of unaddressed issues that translate into continuous inequities in the relationship fishers have with fisheries and the sea. Nonetheless, one critical issue appears in the findings: most fishers were not aware of the concept of loss and damage within climate policy discussion (Paper II). This reveals forms of hermeneutical injustice, between bottom-up experiences and top-down policy, due to a lack of interactions with the concept and a lack of available resources (e.g. access to decision-making places; language accessibility of information on the topic, etc). As Arias-Shreiber et al. (2022, p. 2) underscore: *"The absence of a conceptual framework to make sense of one's experiences is an injustice because it favors those 'others' whose experiences are represented in the collective body of knowledge"*. This points to the necessity of revisiting foundational framing divides in a constructive manner, while engaging those most affected to collectively reconstruct the notion of loss and damage in fisheries, acknowledging its plural and situated dimensions. Climate adaptation literature shows that acontextual, apolitical policies often worsen conditions for affected communities (Eriksen et al., 2021). As adaptation is central to minimising loss and damage, the perceived persistence of hermeneutical injustice across climate policy themes reflects limits, beyond fisheries, in recognising and engaging with diverse lived experiences and knowledge systems. This has critical implications for understanding, addressing, and governing loss and damage.

Situating loss and damage in the everyday

This section situates loss and damage within everyday socio-ecological processes, examining their significance across spatial and temporal dimensions (RQ2). Critical constructivism reminds us that knowledge and meaning are contextual and experiential. Drawing on qualitative methods, this section attends to how fishers live in the context of everyday loss and damage.

Situating loss and damage in time and space is complex, as it is poorly defined and identifiable. As one fisher indicated (Paper III): *"What to fish, what could be fished, what might happen? Those are normal questions for fishers, but now it is about survival"*. The same challenge appears on the practitioner's side*: "We know many marine phenomena are not visible to us; we continuously reflect 'Is it really lost?'"* (Paper III). This complexity particularly arises in relation to environmental loss, which is valued as a reference point for assessing, discussing, and interpreting losses and damages in everyday life (Paper I, II, III, IV). Intangible loss and damage, such as environmental loss, has a non-finite and ambiguous nature, which is reinforced in the marine context, where knowing about *"life below water"* remains complex **(**Paper II and III). Thus, it is complex to know the state of loss, what loss is, and to what extent it is taking place, as changes are not immediately perceptible, are ongoing, and are cumulative. Baker et al. (2020) have pointed out in this regard the critical importance of Seychelles fishers' situated knowledges, given their daily interactions, to provide insights into providing information about temporal and spatial dimensions in the context of marine conservation. Overall, fishers refer to significant events to remember when loss became apparent to them, referring to a noticeable point of no return. One fisher emphasised that "*it has always been this way, harder each year, but the senior stories make us understand that everything was different"* (Paper III). This finding relates to the shifting baseline syndrome (Pauly, 1995), which is known in fisheries but not yet addressed in the context of loss and damage (e.g. Papers I, II, III, IV). These shifting baselines are influenced by experiences and the historical socio-cultural ecological context in which a person is embedded (Alleway, 2023) (Papers II, III). Additionally, temporal differences between environmental and social loss appeared in the findings (Paper II). Aswani et al. (2016) found that there are asymmetries between perceived environmental and social recovery following series of extreme events in Western Solomon Islands. This suggests that loss and damage, as has been pinpointed in the literature (Boyd et al., 2021), is hard to bound temporarily. Given the particularity of the fishery context, situating this loss and damage is complex and reveals the critical importance of integrating narratives grounded in lived experiences. The findings illustrate unique experiences and relationships of fishers with the sea and fisheries, shaped by both perceptible and non-perceptible loss, damage, and daily disruptions. The use of qualitative methods in loss and damage studies is here further strengthened to provide critical insights not only on loss and damage per se, but also

on critical pre-existing socio-cultural, political, and environmental events and drivers that might not be captured through quantifiable climate metrics.

Additionally, the non-finite and ambiguous nature of loss and damage is reinforced by transboundary ecological systems: fish species evolve beyond borders, across countries' jurisdictions. As one fisher stated: *"We observe, and we note, but we do not know if the fish are here, if they have left somewhere else, or if they are just gone forever"* (Paper III). This is notably the case for the flying fish, considered to be lost in Martinique, and for the steady decline of tuna (Thunnus spp.). As one fisher stated, remembering the flying fish: *"I have goosebumps when talking about it, it was boats and boats of flying fish"* (Paper II, and III). For these and other species: *"We had shoals before, but they are not seen anymore"* (Paper II). This decline in species aligns with regional perceptions (CRFM, 2019; CRFM, 2020) and trends in tropical fisheries' productivity (IPCC, 2019; Lam et al., 2020, Xu et al., 2024). Aware of the transboundary nature of fish, fishers consider loss and damage in regard to the place in which they operate daily (Papers II, III). Situating loss and damage thus involves, on the surface, an understanding of the meaning, in the context of space, or seascapes, to people. Given Martinique's unique jurisdictional status, the inclusion and recognition of Martinique fishers in the Caribbean raises additional questions on its representation, and equity in regional distribution. Loss and damage in fisheries reminds us that the assumption behind the Annex I/non-Annex I countries dichotomies, when it comes to environmental loss in the fisheries context, is not adequate, and might sideline lived experiences. For instance, in the go-along, focus-groups and semi-structured interviews, fishers recalled the location of recent shoals, and disrupted movements of fish across seasons in the region, regulatory boundaries, and exchanges with Caribbean peers, unravelling the transboundary nature of fisheries as more than just a regulatory discussion, but also something that has intangible implications, given the increased challenges in knowing the definite state or presence of species and marine coastal biodiversity.

Faced with these uncertainties, fishers undertake localised and spontaneous adaptations that are socially constructed in relation to traditional multi-species and multi-gear species, to adapt and sustain their activities. This was particularly noticeable through the go-along and observations: fishers talked about their knowledges and exchanges with peers on the state of the sea. However, while the choice of gear selection was defined according to the seasonality, since the last 13 years the selection must be done based on daily examination. As one fisher underscored, what was considered "*a good fishing day"* approximately 10 years ago is now considered a *"miraculous one*" (Paper III). This notably emphasises the social, cultural, and ecological construction of adaptation strategies. To continue their livelihoods, fishers balance climate events, weather, sea conditions, and rules and regulations. However, access to support following an event is undermined by administrative challenges, as noted by one fisher: "*The quantity of data and documents required in a short time is not possible for all of us to mobilise them*".

While fishers exhibit a reactive form of adaptation, they also engage in mobilisation when it is needed, particularly regarding socio-economic decisions that might undermine any attempts to sustain their traditional fisheries and to adapt to socio-ecological changes. Indeed, fishers emphasised *"When we are heard, it's when we mobilise or strike"*. This sentiment reflects the structural inequities within the island, which have not been addressed. This statement additionally underscores a broader sense of disenfranchisement with regard to policy discourse (Paper III, IV). Looking at well-being loss as a non-economic loss amongst Arctic communities, Ayab-Karlsson et al. (2024) point to the need for future research to explore the link between past and present trauma relating to colonisation and current well-being issues. This strongly aligns with the Martinique scholar and psychiatrist Frantz Fanon's (1952, 1976) work on the impacts of colonisation, which need to be addressed as part of efforts towards justice, restorations, and reparations in the context of climate change.

Emotions appear in the findings as critical to understanding what is valued as loss and damage, how fishers navigate this, and what needs to be resolved. Emotions came strongly to the fore in semi-structured interviews, which offered a more private setting than focus groups. The findings underscore that emotions situate and shape how environmental loss is experienced and framed, and can drive hope and action (Paper III). All fishers emphasised the impacts of loss and damage on their health, whether physical (e.g. deafness) or mental (e.g., depression)—particularly when it affects the family—and also on their *"pride in being a fisher"*, as one stated: *"a fishers that doesn't fish..."* (Paper II, III). In parallel, fishers ' positive emotions also shape fishers' perseverance in proceeding with fisheries. These positive emotions are derived from faith, their inner circle, and their ultimate love of fisheries, which represent "freedom" (Paper II). As one fisher underscored: "*when we land, we land to our problem*".

Brosch and Sauter (2023) emphasised the critical need for climate change research to not only focus on negative emotions but also the positive ones. The findings illustrate that fisheries is not just a job; the loss and damage revealed in this study emphasises the way of life and well-being that fisheries represent. The grief, anxiety, and uncertainties across space and time underscore the critical need to situate loss and damage within lived experiences, to reveal root causes, meanings, complexities, and nuances that are critical for developing effective ways of minimising and addressing loss and damage. Additionally, the central anxiety posed by the impacts of their activities on family suggests there is a need for equitable consideration in regard to support to minimise and address loss and damage, not only relating to the loss indicated but also to the socio-economic charges. This implies the critical importance of intersectional approaches (Paper I) for just and equitable distribution policies.

In summary, situating loss and damage in the everyday involves navigating ambiguity and uncertainty, for all actors in fisheries (Paper I, II, III, IV). The

insights reveal that, in policy framing, the focus on those uncertainties remains on the biophysical side of things. In contrast, in everyday life, those uncertainties involve personal and historical, socio-economic, and environmental dimensions, which are dealt with daily. This suggests a need for continuous trade-offs and negotiation between what of value needs to be sustained, sacrificed, or forgotten. These findings also bring forward explicitly the emotional dimensions of loss and damage, in Blue Justice scholarship. In parallel, Blue Justice scholarship reveals that these experiences are matters of justice and equity in loss and damage in the fisheries context.

From bottom-up lived experiences to a top-down vision of loss and damage

This section explores how diverse knowledges shape the governance of loss and damage in tropical fisheries (RQ3). It analyses competing narratives of loss and damage, from lived experiences to institutional perspectives. It highlights how unaddressed justice and equity issues deepen the divide in regard to how loss and damage is shaped by knowledges and action.

Drawing on the meta-theory of critical constructivism, the findings demonstrate that there are different social constructions of loss and damage, which influence what counts (Paper I, II, III, IV). From bottom-up lived experiences, loss and damage is socially constructed in seascapes through socio-ecological interactions. This contrasts with a construction of loss and damage that is standardised, using quantifiable metrics, which reinforces a focus on economic values, and economic loss and damage. The findings underscore that loss and damage from bottom-up experiences in fisheries and place-based knowledge is shaped by ambiguities in the nature and extent of loss and damage (Paper II, III) and the policy framing is shaped by ambiguities resulting from the political vagueness surrounding the concept across political levels (Paper I, II, III, IV). The intersection of these two ambiguities produces a significant gap in recognitional equity in lived experiences in fisheries (Paper IV). One fisher, on viewing non-economic loss in the global policy typology tool, said: *"I did not talk about this loss and damage because we are not usually asked about it.*" (Paper III). Additionally, the findings underscore that fishers integrate both extreme events, and particularly slow-onset events, while, on the other hand, as one practitioner stated: *"We address so far climate change in the context of emergencies"* **(**Paper III). This reinforces the emphasis on emergency ex-post assessments, which focus on addressing immediate loss. Indeed, mechanisms available nationally for climate impacts, and at the supranational level for fisheries, tend to focus on ex-post events, which influences the extent to which loss and damage is valued as critical and to be supported (Papers II, III, IV). A practitioner

underscored: "*The more we have intense events, the more the cyclonic reference change".* This leads to further rendering invisible some forms of loss and damage considered as existential in everyday experiences, such as slow gradual events and extreme event with lesser intensity. Thus, there are critical questions in regard to what counts as loss and damage, whose values are applied, and which knowledges systems are integrated in regard to loss and damage in fisheries. This relates back to the emergence of the Blue Justice concept (Isaacs, 2019; Blythe et al., 2024), and its emphasis on the recognition of small-scales fishers and coastal populations in ocean-fisheries-related discussions, as the foundation of any equity-oriented decisions (Pascual et al., 2014; Bennett et al., 2025), with the aim of achieving ocean sustainability. This suggests that by considering the issue through an equity lens, the ambiguities surrounding loss and damage can be better understood, particularly in terms of who is affected and why the loss and damage occurs. This approach has critical implications for effective implementation (Paper IV).

As in climate policy, in regard to the drivers of loss and damage, a distinction can be made between the different constructions of loss and damage. Fishers construct their narratives of the drivers of loss and damage as relational and historically bounded in time, through socio-ecological relationships and processes, thus departing from an emphasis on biophysical impacts (Paper II, III, IV). The findings reveal that knowing about loss and damage is about knowing what the pre-existing socio-ecological conditions were. In the context of Martinique, loss and damage is entangled with a painful history of dispossession under colonisation which influences conceptions of loss and damage, and which is expressed through similar vocabulary (e.g. loss of culture, loss of identity, mental health, and access and resources). The need to recognise the broader context in which loss and damage takes place is acknowledged in the loss and damage literature (Serdeczny 2016; Roberts and Pelling, 2019; Boyd et al. 2021; Henrique et al. 2022; Huber and Murray 2023; Ayeb-Karlsson et al., 2024; Bhowmik et al. 2024). However, the Martinique and Caribbean scholarship takes to a more detailed level by putting emphasis on the socio-ecological context where this relationship has started for people (Ferdinand, 2016; Ferdinand, 2018; Davis et al. 2019; Abimbola et al., 2021; Perry 2022; Dean, 2023; Baptiste and Robinson, 2023) (Paper II). To this extent, Caribbean scholars call for an epistemic shift, where historical and structural injustices are considered in the context of socio-ecological changes and climate change (Ferdinand, 2016; Ferdinand, 2018; Davis et al. 2019; Abimbola et al., 2021; Perry 2022; Dean, 2023; Baptiste and Robinson, 2023) (Paper II). Ferdinand (2018, 2020), in the context of Martinique, goes further, emphasising the need to consider France as having plural geographical locations, and thus plural epistemologies, in which environmental issues must be understood through the intersections of slavery, colonisation, and postcolonial claims. This implies that addressing distributional inequity in loss and damage is not just a matter of present harms, but rather is a cross-temporal matter, as loss and damage is related to past contextual cross-cutting equity issues. To this extent, the concept of hermeneutical injustice (Fricker, 2007)

is, in this thesis, further enriched in the context of loss and damage in fisheries. Indeed, the findings demonstrate that hermeneutical injustice in the context of loss and damage is not only intragenerational, it is also intergenerational: the absence of resources with which fishers' can make sense of their experiences in policy, due to a history of inequities, is perpetuated through existential loss and damage (e.g. relating to identity, sense of place, culture) (Paper III). This suggests that minimising and addressing loss and damage implies the consideration of an extended timeframe, not solely addressing future risks, but also looking at the historical context, as future generations may inherit a lack of the interpretative resources in relation to climate change impacts. Indeed, contrasting with viewing fisheries as a sector, the findings underscore that fisheries are, first and foremost, cultural, as illustrated by one practitioner*: "fisheries here do not cover all needs or are a huge share of the economic activity. Still, it remains important; it holds a historical, cultural significance"* (Paper III). Fishers call for an epistemic shift where they are seen as knowledges sources, and solutions makers in minimising and addressing loss and damage, as one fisher emphasised: "*We need to defend our heritage; our ancestors did it. Now we need to do it with the increased pressures we have with climate change and the other struggles"* (Paper III). In particular, as one practitioner noted: *"We have not succeeded in understanding how to face climate change. We need to know where it starts to know where to go"*. Alleway et al. (2023) underscore how place-based knowledges can significantly enrich our understanding of baseline shifts, particularly when the inequities embedded around Western epistemologies dominance are acknowledged. Critical constructivism, and a Blue Justice lens, suggest the critical need for epistemic repair (see Stokas, 2023) across the levels of governance addressing climate change and fisheries, with persistent past injustices seen and addressed, in order to enable an inclusive construction of loss and damage that equitably integrates fishers' experiences (Paper IV).

However, moving from a top-down vision to a bottom-up vision cannot happen without procedural considerations relating to critical equity considerations (Paper IV). First, as the findings underscore, in loss and damage, climate change intersects with other socio-ecological processes. Institutionally, fisheries is treated as a sector, and climate change is treated as a cross-cutting issue, which implies a potential fragmented governance system when it comes to loss and damage. For instance, Ferraro et al. (2023) count approximately 12 institutional entities in La Réunion (French overseas an EU outermost region in the Indian Ocean) involved marine biodiversity from the subnational to the national level, and identify overlapping of competencies, a lack of involvement of local stakeholders in the decision-making process, and challenges in subnational implementation due to bureaucracy, and political and societal pressure, along with a lack of coordination and decentralisation. Fragmented governance can undermine the connection between dimensions of loss and damage and its drivers by separating out climate impacts.

Rambourg et al., (2025) underscore procedural inequities in the Indian Ocean Tuna Commission (IOTC) context, whereby EU outermost regions are not entitled to direct participation, and thus the role of intermediate bodies, such as the EU Advisory Council for the Outermost Regions is critical. On the Caribbean side, the findings underscore that loss and damage is discussed through the Caribbean Regional Fishery Mechanism, yet, as pinpointed by the High Council on Climate this is not yet addressed in the context of France, and nor is social vulnerability (Paper IV). This suggests that implementing measures to minimise and address loss and damage is dependent on an integrated multi-scalar approach that recognises the historical socio-ecological processes that have shaped loss and damage. Additionally, clear governance structures and coordination mechanisms, along with clarity on accountability, are critical requirements for equity.

In summary, moving from a bottom-up vision to a top-down vision requires an epistemic shift. This is critical, as the current policy framing is too narrow to account for the losses and damages in the everyday, and for complex temporal and spatial nuances. While constructive ambiguities are useful in negotiations in the short term, stepping out from this political sphere to lived experiences reveals that in concrete settings and in the long term these ambiguities—by obscuring root causes and accountability, and leaving ambiguities to be decided by specific actors—can perpetuate or reproduce forms of injustice and inequities, be these hermeneutical or other forms. A Blue Justice orientation, grounded in critical constructivism, demands a rethink of the framing of loss and damage in fisheries, one that looks into patterns of inequities across levels of governance, identifying precise bottlenecks in policy and practices. As Bennett et al. (2025) emphasise, recognition is indeed the first step, to touch upon procedural and distributional inequities. However, in the context of loss and damage, restorative, reparative and transformative justice, requires establishment of an equity focused multidimensional framework involving knowledges, values, needs, and aspirations of those experiencing loss and damage in tropical fisheries.

Conclusion

Summary of findings

This thesis has critically analysed and explored the framing and lived experiences of loss and damage in tropical fisheries, and their implications for a just-oriented governance, using Martinique (France) as a case study. Applying a critical constructivist framework and a Blue Justice lens, this study underscores the importance of attending to lived experiences, and of a discursive framing, for just, equitable, and contextually relevant governance of loss and damage. I have employed a combination of concepts that allows me to gain insights into the subjective interpretations, experiences, and social interactions shaping governance in the context of loss and damage in tropical fisheries. Situated knowledge, introduced by Harraway (1988), has been fundamental, in this thesis, as a departure point for investigating the lived experiences in tropical fisheries. It foregrounds the relational and contextual nature of knowledge, revealing the plural socio-ecological processes intersecting with climate change to shape the outcomes of loss and damage. As loss and damage refers to the meaningful impacts of climate change, the concept of values has highlighted the potential infinite ways in which loss and damage can be experienced. In particular, the concept of values has revealed the existential place that the marine environment holds in fisheries. From situated knowledges and values of loss and damage, the thesis uncovered hermeneutical injustices in constructing narratives of loss and damage in fisheries, with divergent framings and a lack of recognition and meaningful involvement of the lived experiences of loss and damage in fisheries in decision-making processes. The application of these concepts was supported by qualitative methods that engaged fishers and practitioners to identify patterns relating to the framing, experiences, and governance of loss and damage in fisheries, under the conceptual tools that were applied. Through a systematic review, empirical investigations of fisheries in Martinique (France), and an multidimensional equity framework for governing loss and damage, the thesis has highlighted the diverse ways in which loss and damage is framed and experienced, and the implications for just and contextually grounded governance approaches.

First, narratives of loss and damage in fisheries underscore that loss and damage is a situated, relational, and multidimensional concept in everyday life, which is

distanced from a hegemonic framing of loss and damage that aims for standardisation and that is rooted in quantitative economic valuation (Papers I, II, III, IV). Differences in how loss and damage is framed, combined with the limited inclusion of narratives grounded in lived experience, contribute to a narrow understanding of loss and damage. This leads to significant inequities in the recognition of loss and damage, particularly by overlooking fisheries as a way of life that is central to well-being in seascapes. In contrast to dominant framings that construct loss and damage primarily around biophysical impacts and extreme events, I show that, in lived experiences, loss and damage is constructed as an outcome of how climate change intersects with pre-existing historical and socio-ecological processes, both within seascapes and beyond (Paper I, II, III). This finding brings into view distributional inequities in experiences of loss and damage within a country (Paper IV). Gaps in acknowledging these contextual drivers hinder the development of effective adaptation strategies and limit the ability to address loss and damage in a meaningful way.

The thesis has shown that loss and damage is profoundly about managing ambiguity and uncertainty. More precisely, in a context of "constructive ambiguity" in policy, coupled with ambiguities and uncertainties in lived experience regarding the nature, temporalities, and extent of loss and damage, small-scale fishers appear as both archives of knowledge and agents of change. Drawing on equity dimensions (Paper IV), this thesis highlights the institutional fragmentation across governance levels and between climate and fisheries institutions, which exacerbates inequities in the mechanisms for incorporating narratives from small-scale fisheries.

Thus, narratives of loss and damage in fisheries remain in the process of construction, as they cannot be fully realised without the inclusion of small-scale fishers. The true constructivist potential lies within the ambiguities and uncertainties of loss and damage, within the open theoretical space. However, this potential can only be realised if narratives from small-scale fisheries are genuinely acknowledged and meaningfully engaged with.

Contribution

Climate change (Lazarus, 2008; Incropera, 2016) and small-scale fisheries (Jentoft and Chuenpagdee, 2009; Said et al., 2019) are both considered to be "wicked" problems ("complex, intractable, open-ended, unpredictable" (Alford and Head, 2017 p.397)) and suggest the need for better contextual understanding. My research takes an interdisciplinary focus, bringing together climate change, oceans and fisheries, and justice and equity research in the real-world setting of loss and damage in tropical fisheries. Thus, the thesis emphasises the need to address both social and

ecological dimensions of loss and damage, based on the narratives of those impacted, to foster ocean sustainability through applying a more contextual and evidence-based understanding. As Paterlow et al. (2023) underscore, addressing impacts on people, championing justice and equity, and leveraging knowledge are key areas of social intervention for ocean sustainability.

My work contributes to sustainability science by applying a critical constructivism approach and a Blue Justice lens to advance the understanding of the nature and extent of loss and damage, viewed through a justice and equity-oriented framework. In particular, it enriches narratives of loss and damage, by challenging the hegemonic narratives in policy and foregrounding equity and justice dimensions, framed by those impacted. While reflection on loss and damage has started in the context of fisheries, notably through FAO's (2023) work on defining and measuring loss and damage in fisheries, there is a lack of empirical evidence that departs from the context of fisheries to inform governance of loss and damage in fisheries. This leaves an important gap in the discussions on whether and how the concept of loss and damage is understood locally, and if these narratives are reflective of local realities. Through the use of a conceptual approach bounded by critical constructivism and a Blue Justice lens, this thesis brings attention to how loss and damage in fisheries are context-dependent in regard to relationships with seascapes and fisheries. Through employing qualitative methods, the thesis has identified overlooked dimensions of loss and damage—emotional, social, and cultural dimensions—which are critical when considering fisheries and ocean sustainability. And, importantly, the thesis has revealed critical spatial and temporal dimensions of loss and damage, which are at the core of any initiatives to promote sustainability. The thesis has also contributed to defining loss and damage as multifaceted, multidimensional, discursive, value-laden, and justice and equity-driven in the fisheries context. Additionally, through the Blue Justice and equity focuses, the research has revealed loss and damage as not only a social-ecological intragenerational and intergenerational issue, but also as an epistemic one. Thus, this thesis contributes to a more pluralistic understanding of the nature, extent, and drivers of loss and damage in tropical fisheries, enriching progressively emerging global conversation.

Spalding and McKinley (2025) emphasise, in their reviews of marine social sciences, a lack of guidance or a governance framework in the ocean and fisheries context, connecting with climate impacts. The thesis provides insights relating to reframing loss and damage in fisheries and points to the need for context-specific approaches to minimising and addressing loss and damage. While adaptation was not within the study's scope, this thesis also provides an interesting lens that can be used to connect adaptation limits and loss and damage. These insights are critical; this thesis contributes to an emerging field of loss and damage associated with climate change within social sciences by underscoring that loss and damage is a

matter of values, and constructed in context. In parallel, this thesis has contributed to Blue Justice scholarship by linking the issue of loss and damage to this scholarship and by emphasising its critical importance in providing insights relating to forms of inequities that contribute to maintaining or reinforcing loss and damage. This further emphasises the fact that ocean and fisheries sustainability must be grounded in justice. Additionally, the thesis has connected critical constructivism to the space of Blue Justice in the context of loss and damage.

Limitations and future directions

This thesis provides new insights into different ways of experiencing, valuing, and knowing loss and damage, to better understand the shaping of just governance of loss and damage in fisheries. However, some limitations need to be highlighted.

Critical constructivism and a Blue Justice lens offered valuable contextual insights by centring attention on those who are impacted, in regard to the dominant policy framing. As it uses qualitative methods, I acknowledge that this study does not aim for generalisation, but it can provide critical insights for French overseas territories, EU outermost regions, non-sovereign territories in tropical areas, and SIDS. Future studies could build on these insights and combine different methodological tools relating to both qualitative and quantitative methods, to support a more comprehensive understanding that can enhance the generalisability of the findings. Quantitative methods can identify broad trends and insights, but they must be carefully applied as they can also risk oversimplification and misinterpretation, thus creating further equity and justice issues. Indeed, as the thesis's analysis emphasises, the starting point should be the situated knowledges and experiences of those impacted, so as to define the problem in a way that is context-relevant. More precisely, understanding the relationality of loss and damage in a context, and the plural ways of knowing, and values, are the first steps required to provide insight into which quantitative methods can be embedded to support better generalisation of the findings. This requires acknowledging the socio-ecological context dimensions, having an interdisciplinary approach, and acknowledging how different knowledges shape solutions. It also requires more integration between marine social sciences and climate change across epistemological and ontological divides to operationalise a framework for loss and damage in fisheries aming at addressing and minimising loss and damage. Additionally, loss and damage research should further connect with adaptation limits research, as the two are deeply interrelated.

Conceptually, it could be enriching to apply a feminist, post-decolonial lens to analyse roots causes of, and structural problems of, knowledge construction regarding loss and damage associated with climate change, to continue to push for

more diverse and inclusive nuance pertaining to loss and damage, given its contextual nature. Indeed, both feminist and post-decolonial lenses emphasise the plurality and local/situated production of knowledge and the need to make visible and known what has been hidden (Dutta and Das, 2023; Porcuna-Ferrer et al., 2023). More precisely, they aim for "decentring the dominant ways of thinking" (Porcuna-Ferrer et al., 2023 p.2) and for bringing to light differences. Feminist fisheries scholars have started to draw attention to the need to look at fishermen through the lens of feminist concepts and tools (Knott and Gustavsson, 2022; Pauwelussen, 2022). Knott et al., 2022, (p. 1674) highlight the need for further studies that consider the ecological embeddedness of fishers. For postcolonial scholars, the silence of differences can be seen through processes of the "coloniality of knowledge" (Burman, 2017; Abimbola et al., 2021).

A future research focus could include a deep analysis across levels of governance in fisheries and climate change, to further reveal where the institutional bottlenecks are that constrain synergies, coordination, and equitable governance of loss and damage across scales. Additionally, how finance for loss and damage in fisheries, could take place with equity at the center. To this extent an analysis of interlinkages between conventions such as the UNFCCC, the Convention on Biological Diversity (CBD), IPBES, and IPCC in the context of loss and damage in fisheries could advance the understanding of governance challenges. Wam (2024) for instance emphasises that if climate change is framed as a pollution, the United Nations Convention of the Law and the Sea (UNCLOS) could make countries legally obligated to contribute to the loss and damage fund (cf. Article 235), while suggesting a two-tiered system for the fund, where contributions come from both industries (first tier) and governments (second tier) based on emissions and financial capacity. At the supranational and national levels, a focus could be placed on which institutions and mechanisms can govern loss and damage in fisheries equitably by recognising and meaningfully involving small-scale fisheries actors. Indeed, while this thesis provides insights that can be used to operationalise justice-oriented approaches to loss and damage, without broader systemic shifts, the voice of small-scale fishers will remain quiet—and even unheard—with regard to loss and damage.

Critically, there remains a need for more empirical evidence from small-scale fisheries, as small-scale fisheries exist in multiple socio-cultural and environmental contexts; more studies are needed.

Wider implications

This research supports the development of strategies to address climate change loss and damage in fisheries that are locally and justice-equity-oriented. The findings of

this thesis can guide practitioners by providing insights into the multidimensionality of loss and damage regarding both slow-onset and extreme events. Additionally, the wider implications of this work suggest a need for integrated approaches to loss and damage in fisheries. The findings can also guide future critical engagements on loss and damage in fisheries, from the local to the global level, including in relation to UNFCCC, FAO, and, additionally, EU and Caribbean fisheries organisations.

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Climate change is reshaping the world's oceans, placing small-scale tropical fisheries at the forefront of loss and damage. Despite this, the lived experiences of those affected remain underexplored, raising critical questions around the concept of Blue Justice: What constitutes loss and damage? How is it measured, for whom, at what scale, and why does it occur?

Through an interdisciplinary approach, this thesis examines the nature and extent of loss and damage in the small-scale fisheries of Martinique (France). It offers insights into how loss and damage are understood and addressed, advocating for just and equitable governance that recognises and meaningfully involves the experiences and knowledges of those affected in policy decisions aimed at minimising and addressing loss and damage, while fostering sustainability.

ALICIA N'GUETTA is an interdisciplinary researcher exploring the intersection of climate change and social justice in marine and agricultural contexts. She has a background in economics and politics, agricultural economics, international development and sustainability.

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