The Potential of Mediterranean Non-state Approaches in Light of IUU Fishing

Advancing the Recognition of Italian Small-scale Fisheries

Author: Nils Kroon

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Environmental Policy Group
WAGENINGEN UNIVERSITY

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Written by Nils Kroon (1160516)

Wageningen University & Research supervisor: Hilde Toonen

Environmental Policy chair group of the MSc programme Aquaculture and Marine Resource Management at Wageningen University & Research.

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Preface

Dear reader, in front of you, lies a product resulting from a longstanding effort and my ever-increasing fascination with exploring best practices in marine governance. About ten years ago, I became aware of the widely addressed concerns regarding the poor ecological status of the Mediterranean Sea. At that time, I was primarily focused on the marine populations and environments that expressed a considerable need for effective governance. As life continued, I wondered how this region could have ended up in a situation where it was deemed 'the most overfished sea' in the world. I understood that the challenge primarily lies in the governance of Mediterranean fisheries and what were perceived as necessary efforts to '"fight illegal, unreported and unregulated (IUU) fishing practices". Still, these also concerned fisheries subjected to the EU governance system, which I, perhaps naively, always considered as a complex but highly effective system. Later, I understood that, even with good intentions, the governance system might have set itself an objective with an immense challenge due to the multi-specific complexity of the fisheries it subjects itself to in such a large geographical area. Indeed, I became aware of the challenge of governing small-scale fisheries and that, while they are as much a fishery as any other, the methods to ensure their effective governance deserve to be approached significantly differently than what is considered traditional in fisheries governance. This raised another question regarding the effectiveness of recognizing the multi-specific aspects of these fisheries in governance efforts and whether considerations of widespread Mediterranean IUU fishing practices could be genuinely considered fair, without such effectiveness. While I never denied the efforts of Mediterranean state authorities and state-supported institutions in efforts to improve these methods, I kept wondering, *"Why should the governance system only be limited to state approaches?"* and *"Surely, especially in such a large geographical area with such multi-specific fisheries, other hands should be able to be considered as capable of credibly helping to carry the load of effective governance?".* My continued conviction that reality should never serve the simple effort of dichotomous thinking supported these yearlong questions. As such, I remain convinced that no fisher should be inherently considered criminal or legitimate. Likewise, I maintain a critical attitude toward the notion that governance should be based on convictions that only certain actors can serve the effectiveness of governance while deeming the consideration of unconventional forms of governance support as unnecessary or unrealistically challenging. I doubt this attitude of mine will ever change. However, I also remain open to attempting to understand someone else's view. This is my thesis, which might demand such a similar open mind, as it questions conventional methods of environmental governance with the sole attempt to improve it. While questioning conventionality might lead to paths not yet wandered associated with unfamiliar challenges, a preconceived severity of such challenges should never be unquestionably considered as a reason to ignore possible paths toward improvement, especially when the situation urgently calls for it.

Acknowledgments

I want to express my profound gratitude to Hilde Toonen for providing me with expert feedback, allowing for a better quality of the research process and the thesis. The flexibility she offered in her guidance was also greatly valued, as the research efforts were performed entirely in parallel with a part-time job that often received a full-time investment. On that note, I would be remiss in not expressing my deepest thanks to Menno Bax for providing me with the space, flexibility, and support to finalize the thesis. The shared acknowledgment that this concerned a short-term process and that my support for the MSC holds considerably more history and long-term commitment also granted me the necessary peace of mind to properly finalize this process. Furthermore, I initially anticipated a considerable challenge in reaching experts willing to share their time and insights to aid the research process with their already busy schedules. However, the responses received and willingness to participate in their research exceeded expectations. Thus, I extend my sincerest appreciation to all who participated in sharing their expert insights, of which I learned immensely. As always, I am indebted to my parents for their ever-present and -continued support in my academic endeavors. Their expressions of pride in my accomplishments have the power to act like jet fuel, and their home is a much-valued place to land during turbulent times. Albeit something that should not be emphasized in a friendship that nears a decade, the possibility to discuss general research developments and encountered obstacles with Luc Roozendaal often brings me much-appreciated new insights and improvements to the quality of the process. Likewise, the regular check-ins of Maurits Kooij and his shared reflections on the similar steps he had already taken reassured me that two experts in marine governance were always a phone call away for the necessary advice. In general, I want to thank everyone with whom I have spoken in the last year for allowing me to share little exciting novel life developments and simply expressing interest in how the thesis was progressing. Lastly, in the words of the poet Calvin Cordozar Broadus, I want to thank me. Without coming across as arrogant, a sense of self-worth and the faith that all can be reached with sufficient effort is not a given and something that has not always been present within me either. I am thankful to be in an excellent state of mind that regularly confirms that dreams can be formulated into plans, for which I can receive outstanding multi-faceted support, big or small, from all the people in my life and the people I have yet to meet.

Abstract

The Mediterranean is faced with a significant presence of IUU fishing activities. As such, multi-level state authorities have indicated the need to combat these activities through more effective means of control. However, they also addressed their ambition to consider better the socio-economic challenges that might follow from these control measures. This indicates that the multi-level governance system is starting to understand that the lack of recognition and inclusion of Italian SSFs in multi-level governance processes can also be considered a critical driver of this significant presence of IUU activities. Facilitating more contextualized regulations and co-management of Italian SSFs are considered effective methods to increase this necessary recognition of Italian SSFs. However, enabling this would demand reform of the current multi-level information system, which is expected to be associated with informational challenges that can arise in enhancing current information flows and validating novel ones. This research aimed to contribute insights into the informational challenges that could occur in these efforts. More specifically, the focus was on how these challenges affect state and non-state-supported reform of the multi-level information system to facilitate the contextualization of regulations on the one hand, and co-management of Italian SSFs on the other. It was reasoned that this would provide state authorities and representatives of non-state approaches with the capacity to anticipate the effects of informational challenges and consider solutions for more effective reform of the multi-level information system. Without understanding the effects of these informational challenges in the state- and non-state-supported reform, it seemed unlikely that the GFCM 2030 Strategy, RPOA-SSF, and general state ambitions to enhance the recognition of Italian SSFs could be effectively executed. Ultimately, this impedes the likelihood that Italian SSFs will ever be effectively recognized in multi-level governance with more effective IUU policies. Previous research efforts have reflected the possibility that non-state approaches can aid state activities in fisheries governance. However, these efforts did not address how informational challenges should be expected in supportive efforts and the effect of state approaches on adopting non-state approaches in the state-led informational processes. This thesis has explained how facilitative capacities of non-state informational governance can directly aid state authorities in what their efforts are falling short of. Furthermore, it has been shown that state governance can also provide direct and indirect impediments to the utilization of non-state approaches, following from a lack or willingness of state authorities to adopt change or from the ineffectiveness of the informational processes in the state-led information system. Indeed, this thesis provides a large inventory of expected informational challenges in state and non-state-supported reform. It offers notions for how these challenges can be unique and shared in conventional environmental and non-state informational governance efforts to contextualize regulation and enhance the co-management of Italian SSFs. Most importantly, it has provided novel insights into how combined efforts or the lack of state and non-state approaches will likely decide the prevalence or mitigation of IUU activities in Italy and the Mediterranean.

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List of Abbreviations

Abbreviation	Meaning
ACCOBAMS	Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area
AER	Annual Economic Report
AGRIFISH	EU Agriculture and Fisheries Council configuration
AIS	Automatic Identification System
AMAP	Agency for Innovation in the Agri-food and Fisheries Sector
ASI	Assurance Services International
BMT	Benchmarking and Tracking Tool
BMT	Benchmarking and Tracking Tool (BMT)
CABs	Conformity Assessment Bodies
CCNP	National Fisheries Control Centre
CEG	Conventional environmental governance
CFP	Common Fisheries Policy
CLLD	Community-led local development
CNR	National Research Council - Consiglio Nazionale delle Richerche
CNR-IRBM	Institute for Biological Resources and Marine Biotechnologies
CO.GE.PA	Management consortia of artisinal fisheries - Consorzi di indirizzo, coordinamento e gestione tra imprese della piccola pesca artigianale
DCF	Data Collection Framework
EAFM	Ecosystem approach to fisheries management
EEZ	Exclusive Economic Zone
EFCA	European Fisheries Control Agency
EMFAF	European Maritime Fisheries and Aquaculture Fund
EMFF	European Maritime and Fisheries Fund
ESIF	European Structural and Investment Funds
ETP	Endangered, Threatened, and Protected Species
FAO	Food and Agriculture Organization
FIP	Fishery Improvement Project
FIPSAS	Federazione Italiana Pesca Sportiva e Attività Subacquee
FLAG	Fisheries Local Action Group
GDP	Global Domestic Product

GFCM	General Fisheries Commission for the Mediterranean
GFCM WGSFF	Working Group on Small-Scale Fisheries
GFCM-SAC	GFCM's Scientific Advisory Committee
GFCM-WGSAD	Working on Demersal Species
GSA	Geographical subarea
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICES	International Council for the Exploration of the Sea
ICT	Information and communication technology
IG	Informational governance
IREPA	Institute for Economic Research in Fishery and Aquaculture
ISPRA	Institute for Environment Protection and Research
ITM	In-Transition to MSC (ITM) program
ITQ	Individual Transferable Quota
IUCN	International Union for Conservation of Nature and Natural Resources
IUU	Illegal, unreported, and unregulated
JRC	Joint Research Centre
LGG	Local Governance Group
LIFE	Low Impact Fishers of Europe Platform
LMP	Local Management Plan
LO	Landing obligation
LSF	Large-scale fishery
MCS	Monitoring, Control and Surveillance
MEDAC	Mediterranean Advisory Council
MedPAN	Mediterranean Network of Marine Protected Areas Managers
MiPAAF	Ministry of Agriculture, Food and Forestry
MLS	Minimum landing size
MMW	Minimum landing weight
MPA	Marine Protected Area
MSC	Marine Stewardship Council
MSC CoC	MSC Chain of Custody
MSC OSF	MSC Ocean Stewardship Fund
MSC OSF	Ocean Stewardship Fund
MSC PSP	MSC Pathway to Sustainability Program
MSC RBF	Risk-Based Framework
MSP	Marine Spatial Planning
MSY	Maximum sustainable yield
PI	Performance Indicator

RFMO	Regional Fisheries Management Organization
RPOA-SSF	Regional Plan of Action for Small-Scale Fisheries
SSF	Small-scale fishery
STECF	Scientific, Technical, and Economic Committee for Fisheries
TAC	Total Allowable Catch
TURF	Territorial Use Right for Fishing
VirMA	Virtual Marketplace application (project)
VMS	Vessel Monitoring System
WWF	World Wildlife Fund

1. Introduction

1.1 Background and Research Context

Globally exported fish products have accrued an increase in value from US$143 billion in 2016 to US$164 billion in 2018 (FAO, 2021c). With this significant economic value, incentives for illegal, unreported, and unregulated (IUU) fishing are not difficult to imagine. The FAO (Food and Agriculture Organization; 2021b) defines illegal fishing as any fishing activity that does not adhere to the relevant rules and regulations that are in place in the areas of exploitation. This could refer to regulations of national jurisdiction of coastal states or regulations by a Regional Fisheries Management Organization (RFMO) in the case of fishing practices on the high seas. According to FAO (2021b), unreported fishing concerns the activity of fishing without reporting or misreporting to the relevant national authority or RFMO. Unregulated fishing refers to the performance of activities by unregistered vessels and foreign vessels without legitimate, approved access to resources in a country's Exclusive Economic Zone (EEZ) or of an area controlled by an RFMO. Unregulated practices can also concern fishing activities in areas that are not regulated at all (FAO, 2021c). Indeed, IUU fishing is one of the major problems in global fisheries governance, with considerable socio-ecological consequences. Annual landings stemming from IUU activities are estimated to be 26 million tons (approximately one-fifth of globally reported wild-caught fish), with annual values ranging from US$10 billion toUS$23 billion (Song, 2023).

1.1.1 Mediterranean Fisheries Governance

The Mediterranean Sea, next to the Black Sea, is the marine area in Europe most affected by IUU fishing (FAO, 2021c). The potentially unsustainable practices that take place to an unknown IUU extent, paired with the Mediterranean Sea's relatively high levels of known unsustainable practices, could have significant ecological effects on already fragile ecosystems (Colloca et al., 2013; FAO, 2021c). Assessments in this region made it apparent that of 169 stocks, less than 20% were exploited at levels of maximum sustainable yield (MSY), in contrast to 60% of overfished stocks (biomass at less than 50% of biomass at MSY levels). This primarily concerned benthic organisms, followed by large predators and plankton feeders (Froese et al., 2018). The percentage of stocks experiencing overfishing (fishing mortality exceeding MSY) decreased from 88% in 2012 to 75% in 2019 (Fiorentino & Vitale, 2021). However, the Mediterranean Sea also has one of the most significant rates of biodiversity loss, with 40% of species being in decline (collectively, with the Black Sea; IUCN, 2020b). Next to the ecological effects, IUU practices can limit the fair distribution of economic gain in coastal communities by disrupting supply chains and employment possibilities (FAO, 2021c).

Hilborn et al. (2020) suggest that the Mediterranean was among the regions with the lowest scores for management and enforcement. Multi-level fisheries governance for the sustainable exploitation of marine resources within the Exclusive Economic Zones (EEZs) of Mediterranean coastal states follows from binding recommendations of the General Fisheries Commission for the Mediterranean (GFCM), which are subsequently enforced by each member state of the GFCM (Colloca et al., 2013). The GFCM has acknowledged that limited data is available to measure the extent and impact of IUU fishing activities (FAO, 2017). Furthermore, IUU fishing undermines effective multi-level governance, limiting data availability on total catches, landings, and fishing activities (FAO, 2021c). In turn, this affects the credibility of stock assessments, meaning that IUU practices increase uncertainty in catch advice. Ultimately, this has led to the region being defined as one with a data-poor fisheries management system (Demirel et al., 2020).

1.1.2 The Scale of Mediterranean Illegal, Unreported, and Unregulated Incidents

As Cardinale et al. (2017) and Cashion et al. (2019) suggest and the European Commission (2022) acknowledges, the combination of large fleet size (with diverse cultural, social, and economic characteristics), numerous and widespread (illegal) landing sites, the multispecies nature of the fisheries, and the transboundary dimension of the target stocks impede effective fisheries governance in the Mediterranean Sea. This explains the increased known and suspected Mediterranean IUU incidents from 2019 to 2021 (Global Initiative, 2021). A report from the European Court of Auditors (2022) presented that Italy reported 54% of the total 69.400 observed IUU incidents between 2014 and 2020, accounting for the most observed incidents of all EU member states. Based on considerations of a coastal state's vulnerability, response to, and prevalence of IUU activities, Italy is also the fourth worst-performing European country in the Mediterranean Sea (Global Initiative, 2021). As Russia is not a member state of the GFCM and Ukraine is a non-contracting party, recommendations of the GFCM are non-binding for these countries that are considered to be the first and second worst performing European countries (European Commission, 2023; FAO, 2024c; Global Initiative, 2021). GFCM recommendations are binding for Spain. However, these recommendations are only binding for their administrative regions adjacent to the Mediterranean (FAO, 2024b). This raises the question of why Italy, with necessary adherence to the GFCM's recommendations in all their administrative regions, is showing the highest level of observed and suspected IUU incidents of all European countries.

Italy had the second-largest EU fishing fleet, with 11.269 active fishing vessels in 2016. Most of these vessels (more than 63%) are considered by the FAO (2020) to be part of small-scale fisheries (SSFs). Data on Italian inspections, infringements, and sanctions are not publicly available. This also makes it impossible to define which fleet segments show the most IUU incidents. However, according to Grati et al. (2022), SSFs have relatively higher probabilities of being underreported, -monitored, and -managed. When considering that SSFs also account for most of the Italian active fishing vessels, most of the Italian IUU incidents are likely also following from Italian SSFs.

1.1.3 Effective Recognition of Legal, Reported, and Regulated Activities

According to Pascual-Fernández et al. (2020), the importance of SSFs in the Mediterranean multi-level IUU governance has been emphasized for decades, with some deeming the effective recognition of this sector as being the only way to manage the current crisis in this area. Song et al. (2020) also suggest that generalized definitions of IUU incidents and implemented measures to "fight" this activity by means of criminalization and enforcement, rather than effectively distinguishing all particularities of SSFs, are not only risking the livelihoods depending on SSFs but also the long-term effectiveness and legitimacy of IUU governance. As the authors propose, such generalized approaches could result in the marginalization and de-legitimization of SSFs by denoting them as inherently illegal, unregulated, and unreported. Instead, they suggest that more effective governance should consider constructive and equitable inclusion of SSFs to reduce IUU practices, for which they identified three strategies.

The **first strategy** that Song et al. (2020) suggest would demand that the EU, the GFCM, the FAO, and Italian state authorities be more effectively informed to formulate and update IUU policies with precise language that considers the complete scope of possible socio-ecological characteristics of Italian SSFs. This would benefit the likelihood of more contextualized regulations that effectively distinguish SSF activities that are aligned with multi-level conservation objectives (i.e., ones concerning stock and habitat status) from those activities that are not. Hence, this thesis considered the first identified strategy synonymous with efforts to contextualize regulations of Italian SSFs. The **second strategy** requires international frameworks to decide on shared guidelines and IUU

objectives, allowing each country to determine its ambitions and measures based on national contexts (composition and nature of fishing industries, political systems, etc.). The **third strategy** defines the need for bespoke mechanisms that facilitate co-management management schemes through self-reporting and self-control of SSFs. This should allow Italian SSFs to credibly prove their activities are non-IUU, outside of enforced control and monitoring of state authorities. Instead, it would require state authorities to be able to credibly recognize and validate information, proving systems of self-reporting and self-control complement state efforts to reach shared conservation objectives. Hence, this thesis considers the third identified strategy synonymous with efforts to facilitate the co-management of Italian SSFs.

While these three strategies can be (or are) employed separately, a combination of these strategies has been suggested to increase the overall effectiveness of IUU policies. Also, Song et al. (2020) suggest an order in the identified strategies, in which the radicality of governance reform increases if the primary scale of action shifts from the international/global level to the industry level (see *Figure 1*). However, how strategies combine and how shifts in action occur remain open questions. One entry point for enhancing understanding is to look into information systems, which are crucial to effective fisheries governance, including efforts to combat IUU fishing (Toonen & Bush, 2020). Song et al. (2020) argue that an effective information system and associated informational processes are crucial for executing the identified strategies.

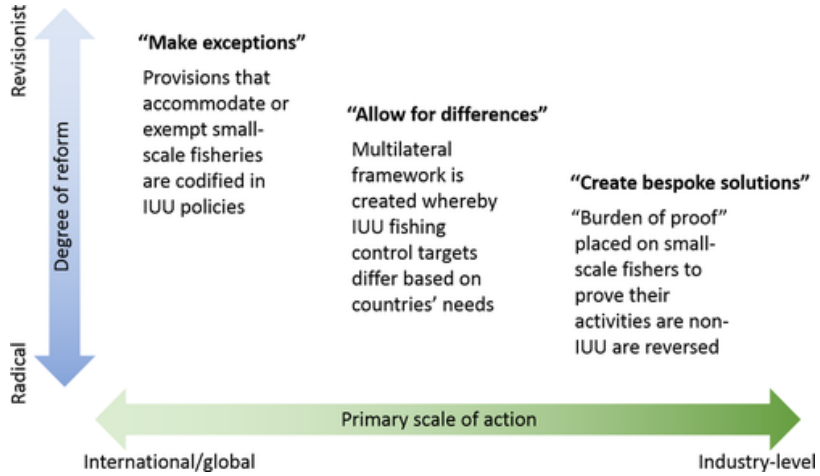

Figure 1: Model of Song et al. (2020) showing the increasing level of radicality in the reform and the shifting primary scale of action, when following the order of their three identified strategies to responsibly incorporate SSFs into IUU fishing regulations.

As Toonen & Bush (2020) suggest, invisible fishing practices can only be governed when made visible. While the underlying logic should be easily understood, the associated informational challenges in enhancing the recognition of Italian SSFs should also be considered. For instance, all stakeholders must consider the collection, transfer, and validation of information legitimate and credible (Song et al., 2020). Furthermore, SSFs must be motivated to share data, and sufficient logistics and infrastructure must be in place to validate this data. Relevant reporting procedures should also consider that SSFs can utilize informal and customary trading relations that impede the possibility of recording data, and that informational provision can also increase costs (Song et al., 2020). Indeed, this additional informational demand also provides a considerable challenge in Italian SSF governance, as is indicated by notions of an ineffective information system. For instance, data availability and harmonized control standards have been deemed insufficient and considerably variable between Mediterranean states (FAO, 2017). Furthermore, Italian SSFs are often not

subjected to electronic monitoring systems, which results in a lack of spatial information that is even more difficult to gather due to the widespread distribution and local differences of SSFs over the entire Italian coastline (Grati et al., 2022). Considering the importance that the information system has to execute the strategies that Song et al. (2020) suggest, the level of radicality and primary scale of governance where most change is necessary could be assumed to follow a similar path in the reform of the information system, as the one presented in *Figure 1*. Indeed, a more radical degree of reform suggests that informational challenges could be more prominent when the primary burden is placed on non-state approaches instead of international/global state authorities.

1.1.4 Informational Challenges in Effective Recognition

In this thesis, only the informational challenges in the contextualization of regulations and the facilitation of co-management were considered, as the current international governance framework subjecting Italian SSFs already seems to provide a structure to execute the second strategy that Song et al. (2020) identified. Namely, the GFCM addressed the necessity of recognizing SSFs to effectively fulfill their "GFCM 2030 Strategy for Sustainable Fisheries and Aquaculture in The Mediterranean and The Black Sea". This strategy contains conditions for recognizing SSFs in relation to healthy seas and productive fisheries, employment, engaged fishers, technical cooperation, and knowledge sharing (FAO, 2021a). Furthermore, a Ministerial Declaration, in the form of the Regional Plan of Action for Small-Scale Fisheries in the Mediterranean and the Black Sea (RPOA-SSF), was signed by several GFCM member states and the EU in 2018. This Declaration aims to improve the recognition of SSFs through a roadmap of measures that must be implemented (FAO, 2021d). The GFCM 2030 Strategy and the RPOA-SSF address the GFCM as responsible for guiding the actions to meet the formulated ambitions by utilizing and supporting national management plans (FAO, 2021d, 2021b). Such plans are also established in Italy and enforced by the GFCM through a decentralized approach that considers the political and socio-economic context on a national and community scale (European Parliament, 2012a). As such, the GFCM 2030 Strategy and the RPOA-SSF already provide an international framework that allows for differences, as Song et al. (2020) suggest in their second identified strategy.

While the GFCM 2030 Strategy and RPOA-SSF plans do provide guidelines that seemingly call for the contextualization of regulations and co-management of Italian SSFs, and even for the improvement of the information system, it does not offer explicit measures to follow up on these guidelines (FAO, 2021a). For instance, the RPOA-SSF has one action that *"calls for the use of appropriate tools to develop information and data collection systems that involve SSFs in the collection of regional-level data on fleets and fishing activities, including the record of all catches"* (P. 10) (FAO, 2021d). However, such guidelines lack specificity and do not present much consideration of the informational challenges associated with such reform in Italian SSF governance, even though this Song et al. (2020) suggest it to be crucial to contextualize regulations and facilitate co-management.

Furthermore, the GFCM 2030 Strategy and RPOA-SSF explicitly address the desire to seek and support any non-state initiative capable of facilitating their execution (FAO, 2021a, 2021d). As followed from Toonen & Mol (2016), non-state approaches focused on the disclosure and use of environmental information (e.g., as a result of labels, certification, benchmarking, product information systems, sustainability rankings, etc.) also provide capacity for (re)directing behavioral changes, outside of direct state regulation (e.g., environmental laws, enforcement, etc.) or market incentives (e.g., subsidies, payment for environmental services, etc.). Hence, examples of non-state approaches complementing state governance are not hard to find (Bailey et al., 2016; Bush et al., 2017; Chuaysi & Kiattisin, 2020; McCluskey & Lewison, 2008). Thus, this thesis considered that the GFCM would not have a challenge in finding non-state approaches with the capacity to aid the

effective recognition and inclusion of Italian SSFs in multi-level governance. Rather, the challenge was expected to be present in the practical consideration of informational challenges and how they affect the application of state and non-state approaches to facilitate contextualized regulations and co-management of Italian SSFs.

1.2 Problem Statement

Facilitating contextualized regulations and co-management of Italian SSFs would demand reform of the current multi-level information system. Such reform is expected to be associated with informational challenges that can arise in enhancing current information flows and validating novel ones. Indeed, the GFCM 2030 Strategy and RPOA-SSF provide guidelines for Member States to facilitate the contextualization of regulations and co-management through state approaches. Furthermore, it explicitly addresses the desire to seek and support any non-state approach with a capacity to aid this facilitative ambition. Following Song et al. (2020), it seemed likely that non-state approaches would play different roles than state authorities, and the radicality of governance reform would increase when moving from state to non-state approaches. However, the paper did not address whether this increased radicality would also translate into more severe informational challenges arising from the different interaction of state and non-state approaches with the information system in efforts to contextualize regulations and facilitate co-management. As such, it is also unclear how informational challenges can affect the application of state and non-state approaches in such efforts. Without understanding the effects of these informational challenges in state- and non-state-supported reform, it seemed unlikely that the GFCM 2030 Strategy and RPOA-SSF could be effectively executed. Ultimately, this impedes the likelihood that Italian SSFs will ever be effectively recognized in multi-level governance with more effective IUU policies.

Thus, exploring the effects of expected informational challenges on state and non-state-supported reform toward more contextualized regulation and co-management was reasoned to provide crucial insights to improve the overall effectiveness of Italian SSF governance. This demanded understanding the necessary enhancement of the current state-controlled information system and its interaction with non-state approaches. To ensure proper consideration of the informational challenges, input from experts in Mediterranean and Italian SSF governance was needed. With the identified effects of informational challenges on the application of state and non-state approaches, it was deemed likely that state and non-state-supported reform could take place more effectively to facilitate the contextualization of regulation and co-management of Italian SSFs. In turn, this would allow for more effective safeguarding of the livelihoods of Italian fishers. Likewise, it would aid the effectiveness and legitimacy of governance by recognizing legal, reported, and regulated fishing activities.

1.3 Research Objective and Questions

This research aims to contribute insights into the informational challenges that could arise in enhanced IUU governance focused on recognizing and including SSFs. More specifically, the focus is on how these challenges affect state and non-state-supported reform of the multi-level information system to facilitate the contextualization of regulations on the one hand and co-management of Italian SSFs on the other. In doing so, the different roles of state authorities and non-state approaches are considered in this reform to identify different effects of the informational challenges that are associated with the execution of the first and third identified strategies of Song et al. (2020). Given the scope of this master thesis, two out of three strategies are studied, representing the two ends of the spectrum of the degree of reform. Providing state authorities and representatives of non-state approaches with the capacity to anticipate the effects of informational challenges and consider solutions was pursued as the practical research objective.

Therefore, the following research question was addressed:
How do informational challenges affect state and non-state-supported reform of the multi-level information system, aiming to facilitate the contextualization of regulations and to enhance the co-management of Italian SSFs?

To add structure to the process of answering this research question, the following sub-questions were answered:

1) ***What is the SSF governance system in Italy?***
2) ***What are the socio-ecological characteristics of Italian SSFs, and which challenges do they face?***
3) ***How is the state-led multi-level information system currently facilitating and constraining contextualization of regulations and co-management of Italian SSFs, and which informational challenges affect its reform?***
4) ***Which Mediterranean non-state approaches can aid the facilitation of more contextualized regulations and co-management of Italian SSFs, and how do informational challenges affect their implementation?***
5) ***Which shared informational challenges affect state and non-state-supported reform of the multi-level information system, aiming to facilitate the contextualization of regulations and co-management of Italian SSFs?***

1.4 Chapter Outline

Theories were explored to explain differences in expected informational challenges associated with the necessary reform of the multi-level information system. These theories resulted in a theoretical and conceptual framework provided in ***Chapter 2.*** The applied research methodology is discussed in ***Chapter 3***. ***Chapter 4*** shows the most relevant authorities and regulatory instruments in the governance of Italian SSFs, providing a baseline indication of the informational demands to contextualize regulations better and facilitate co-managements and the start of the information flows between the information system and the state authorities. The general socio-ecological characteristics and challenges of Italian SSFs are provided in ***Chapter 5***. It was reasoned that to-be-expected informational challenges could partly be identified through how SSF characteristics are currently considered in governance processes. Current challenges to the livelihoods that depend on SSFs were also expected to be partly a result of the effectiveness of the information system and indicative of informational challenges following the necessary enhancement of the associated informational processes. In ***Chapter 6***, the current actors and the efficacy of the multi-level information system are inventoried, as well as expert-identified effects of informational challenges currently limiting conventional governance processes. ***Chapter 7*** exemplifies the capacity of non-state approaches to aid the contextualization of regulations and co-management of Italian SSFs, with to-be-expected, expert-identified effects of informational challenges. Experts also identified shared informational challenges and their impact on state and non-state-supported information system reform, as discussed in ***Chapter 8.*** A discussion of the synthesized research results, together with encountered research limitations, is discussed in ***Chapter 9.*** In ***Chapter 10, conclusive answers to*** the research questions and recommendations for policymakers to enhance Italian IUU governance can be found.

2. Theoretical and Conceptual Framework

2.1 Theoretical Framework

This thesis builds upon the **informational governance (IG)** theory. The formative effect of effectively utilizing information is evident in the definition that Mol (2006) provides. As such, it follows that the constituting and transforming importance of information can motivate actors to have a say about (environmental) governance matters without necessarily considering conventional authoritative forces and state power. In informational governance, information and the associated informational processes, technologies, and struggles play a central role in structuring and ruling institutions, resources, and activities. Indeed, this fundamental importance of information also invites other challenges than those experienced in the conventional environmental governance system. These challenges are more related to ensuring that information is effectively and credibly produced, collected, analyzed, verified, and disseminated in each step of the governance process. Addressing these challenges also means effectively managing how actors are included or excluded in/from informational processes. The effectiveness of this management determines whether an actor is empowered or limited by factors such as how information is collected, verified, or disseminated. As such, control over information also results in different power relations than the ones present in response to conventional authoritative (environmental) governance.

This deviates from the principles of conventional environmental governance systems, which rely on state-appointed, expert-led, and natural-science-based monitoring systems to assess if, where, and when enforcement must be intensified, and policies must be adopted (Mol, 2006). Although the governance form is considered conventional, Ramírez-Monsalve et al. (2021) propose that mandatory state requests from these systems generally provide considerable limitations to inform policy decisions that effectively consider socio-ecological particularities of fisheries. Instead, they argue that such requests are often driven by attempts to link advice to pursued lists of tactical and strategic management decisions. As such, information flows that precede regulatory processes in the conventional environmental governance system can be ineffective, too, and considerable enhancement is needed to facilitate the contextualization of regulations and co-management.

Mol (2006) suggests that IG can provide an extra non-state-led form of governance parallel to state-led efforts, as non-state approaches are capable of formulating processes that can extend the efforts of state authorities based on the constituting importance of information. This also follows from Langhorne (2005), who suggests, "w*hen crises seem to lie beyond the control of governments or the relevant intergovernmental organizations, "non-state" actors come to play significant roles."* (p. 332). Indeed, this also suggests that situations can arise where non-state approaches could more effectively reach objectives shared with state authorities. Still, Song et al. (2020) also suggest that an increased radicality of governance reform can be expected when the primary scale of action moves from state to non-state approaches in efforts to contextualize regulations and facilitate co-management. This also implies that informational challenges follow a similar path of severity, as the conventional multi-level information system must validate novel information flows before they can be deemed credible and legitimately reflect reality. However, governance systems also limit non-state approaches in information production, control, and evaluation due to, for instance, political considerations rather than reflecting actual effectiveness (Ramírez-Monsalve et al., 2021). Thus, it might not necessarily be the credibility of non-state approaches that can exclusively cause informational challenges but also the willingness of governance systems to adapt their application.

This would mean that informational challenges cannot be considered inherently more minor when enhancing information flows in state-led conventional environmental governance, compared to validating novel information flows through principles of non-state-led informational governance. As such, what seems to be implied by Song et al. (2020) can be contradicted, as there appears to be no

reason for a preconceived severity of increased informational challenges when moving from applied state-led conventional environmental governance to non-state-led informational governance in efforts to contextualize regulations and facilitate co-management. Indeed, both the enhancement of conventional information flows and the validation of novel information flows will likely present their own unique informational challenges. Still, these challenges should not be expected to increase intrinsically and linearly from state to non-state approaches in efforts. Rather, if the facilitation of contextualized regulations and co-management is genuinely valued, informational challenges must be anticipated on both sides of the (conventional to informational governance) spectrum. While this might desire consideration of novel informational challenges regarding the production and verification of, and control over, information, the reform toward more contextualized regulations and co-management likely also desires considerable transformative powers, much like the ones that Mol (2006) suggests can be provided through informational governance. Thus, these informational challenges will likely differ from expected ones in enhancing state-led conventional information flows, which might be more related to political willingness and authoritative resources. However, it cannot be inherently reasoned that general efforts should be anticipated to be more severe or demanding in anticipating and managing informational challenges in applied state-led conventional environmental governance or non-state-led informational governance.

2.1.1 Understanding Informational Challenges in Two Modes of Environmental Governance

Certainly, within this theoretical framework, the effects of informational challenges in two modes of environmental governance were considered with a critical focus.

The effects of informational challenges were considered when reforming the information system through **conventional environmental governance (CEG)**. In part, this mode of governance is described by Mol (2006), as he states that "(…) *conventional environmental governance relies on authoritative resources and state power"* (p. 501). However, in this research, the emphasis was placed on the authoritative resources and state power and how they affect the information flows that facilitate the contextualization of regulations and co-management of Italian SSFs. As such, Berkes (2017) suggests that some *"problems do not lend themselves to resolution by the conventional scientific approach of defining objectives, devising experiments to address the problem, collecting relevant data, and making decisions based on these data."* (p. 6). This research considered how CEG would mandate advice from the information system that Ramírez-Monsalve et al. (2021) define as "pulling mechanisms". These pulling mechanisms were supposed to cause unique informational challenges in reforming the information system to facilitate contextualized regulations and co-management. Following the suggested differences in informational challenges by Song et al. (2020), these would have to be the least severe, as they would follow state-recognized and state-led efforts.

Mol (2006) also suggests that principles of IG can be found in CEG systems. For instance, he noted that international requirements could be imposed on countries that relate to IG. This was exemplified in concepts such as regulatory relief for transnational companies with corporate social responsibility programs and product/process information and labeling (Mol, 2006). Indeed, he notes that eco-labeling programs are state-recognized and sanctioned in most advanced industrialized states and that international state-led ecolabelling schemes are developed in the EU. Furthermore, it is essential to note that Mol (2006) suggests that non-state actors (NGOs, consumers, communities, producers, etc.) do not exclusively provide novel information flows and can sometimes be considered part of the CEG system, for instance, in the form of stakeholder working groups or advisory councils. Thus, to test the theoretical framework, non-state approaches that reflected the principles of IG were considered to assess if they would be most affected by informational challenges. This also follows the suggested increase in the radicality of informational challenges of Song et al. (2020) when

moving from state to non-state approaches. Following this logic, they would be most severe when they demand the validation of novel actors (i.e., non-state instead of state-appointed) and novel information flows within the information system. Therefore, to most effectively separate CEG and IG from each other and to ensure clarity in the comparison between the effects of informational challenges on state and non-state supported reform, informational challenges were considered that followed from CEG and the application of **non-state informational governance (non-state IG)**.

Non-state IG was considered to rely solely on non-state approaches for information and knowledge processes. These non-state approaches provided constituting and transformative factors in network governance, considering a wider array of informational instruments and methods to reach conservation objectives, extending the stringent informational demands of CEG (Mol, 2006). These non-state IG actors were considered to have the capacity to aid the production, verification, and control of information (Mol, 2006). Furthermore, it was considered that non-state IG's effectiveness depended on capacities for effective information generation, transmission, access, and application in governance (Mol, 2006). Non-state IG can also enhance information-sharing and decision-making processes more flexibly and provide novel information flows not anticipated earlier in CEG systems (Mol, 2006). As such, it was reasoned that non-state IG would provide pushing mechanisms to aid the information and knowledge processes (Ramírez-Monsalve et al., 2021). The information system must be capable of verifying these novel flows, and sometimes novel non-state actors, as credible and legitimate to facilitate the contextualization of regulations and co-management (Mol, 2006; Ramírez-Monsalve et al., 2021; Song et al., 2020). The effects of resulting informational challenges on the reform of the information system were compared with those associated with enhancing the information flows through CEG.

2.1.2 Research Concepts

To analyze the effects of informational challenges following CEG and non-state IG efforts and to facilitate a better recognition and inclusion of Italian SSFs in multi-level governance, the thesis considered enhancing conventional information flows and introducing novel information flows within the multi-level information system. This follows the informational demands to facilitate contextualized regulations and co-management and a consideration of the necessary forms of these information flows. This section describes the definition of the research concepts utilized to facilitate the exploration.

This research's definition of a **multi-level information system** is a hybrid term that follows elements of the terms "multi-level governance" and "information system". The first term's definition follows from the research of van Hoof et al. (2019), as they state, "*multi-level governance points to sharing policy-making competencies in a complex system of negotiation. The many actors involved in the discussion are located at several levels of nested governmental institutions (supranational, regional, national and local) as well as private actors"* (p. 182). The definition of the latter follows from the general elements of an "information system", as provided by Vladimir Zwass (2023), being "*an integrated set of components for collecting, storing and processing data and for providing information, knowledge, and digital products"*. Thus, the explored multi-level information system concerns an integrated set of institutions, active on all relevant scales of governance, responsible for information transfer that precedes Italian SSF governance. This system contains all informational processes that describe socio-ecological characteristics and transfer information, resulting in more contextualized regulations and co-management of Italian SSFs. Hence, when an institution in this system was identified, all related processes were analyzed to gain insight into the collection, processing and transfer of information on the socio-ecological characteristics of Italian SSFs.

Song et al. (2020) state the necessity of *"more contextualized (…) regulations that distinguish the kinds of small-scale fishery activity that does contribute to stock decline or habitat degradation and those activities that do not."* (p. 838). This is elaborated on by Jentoft (2007), as he states, *"one-size-fits-all governance approach has to be abandoned, and a differentiated method adopted: one that takes contextual factors into consideration. (This) requires data of "a high resolution" regarding, for example, particular habitats, e.g., spawning grounds and biotopes, as well as "vertical knowledge" that enables a deep understanding of ecosystems."* (P. 365). However, Jentoft (2007) also notes the importance of considering socio-economic characteristics by saying, *"There is a similar need regarding social systems, where data would be required at a low level of aggregation. Who are the stakeholders? What is their situation, their ambitions and rationalities? A decentralized governance mode is therefore required to perceive and deal with details and subtleties".* (P. 365). Thus, **contextualized regulations** must be based on the legitimate socio-ecological circumstances of Italian SSFs to allow for effective.

Song et al. (2020) suggest that state authorities must acknowledge legitimate local governance systems falling outside the scope of the CEG system. Jentoft (2007) also suggests that CEG capacities are not inherently capable of effectively considering these local systems, as he says that it *"has no fingers, only thumbs, thus indicating that a lack of detailed information, cumbersome feedback and stretched chains of command deter the state from exercising precision in delicate matters."* (P. 365). Song et al. (2020) also suggest the need for non-state approaches that "*rely on greater self-reporting and control over IUU activity in and by small-scale fisheries*" (P. 8). Furthermore, state authorities must recognize and support secure SSF rights over data and the resources on which self-reporting and self-control are performed, while considering the data collection and transfer as credibly and legitimately representing SSF behavior (Song et al., 2020). This necessary endorsement of state authorities and the delegation and form of interactive governance between SSFs and the government shows clear elements of **co-management**. This is defined by Jentoft et al. (1998) as *"the collaborative and participatory process of regulatory decision-making among representatives of user-groups, government. (…) responsibility for management functions is decentralized and delegated to user-organizations at national, regional and/or local levels. This implies autonomy of users within an overall institutional framework. It also calls for a system of interactive governance and cooperative democracy, whether through direct participation or through representation at levels that transcend local community boundaries.* (P. 423 – 424). From the book of Townsend & Shotton (2008), it followed that the term "self-governance" often falls within the broader category of "co-management". As they put it, *"Co-management has been used to describe essentially any governance alternative to centralized command-and-control regulation. (…) self-governance is about the fishery participants themselves making governance decisions.".* (P. 1). Literature often interchanges "co-management" and "self-governance". Thus, embracing the broader concept of co-management, self-reporting, and self-control in SSFs was considered, with and without state authorities making local governance decisions.

Informational challenges in this thesis followed from assessing the necessary reform of the multi-level information system in efforts to facilitate more contextualized regulations and co-management. It seemed likely that these would in some way relate to generally considered challenges with IG, as defined by Hoefnagel et al. (2013). As such, these challenges were expected to concern topics that regarded multi-level governance, power, the economics of information, informational regulation, institutional trust, and/or collective action. However, these topics were not considered in the research design. Instead, the thesis ensured that expected informational challenges followed independently from relevant stakeholders in the governance of Italian SSFs.

2.2 Conceptual Framework – Informational Challenges in Recognizing Italian SSFs

The IG theory has been used as a lens to construct a conceptual model (*see Figure 2*) that explains the reasoning behind the research. This followed the research subject and goal, namely gaining insight into how the recognition and inclusion of Italian SSFs in multi-level governance can be enhanced. Such recognition and inclusion were reasoned to follow most effectively through reforming the multi-level information systems to facilitate the contextualization of regulations and co-management of Italian SSFs. This research considered that CEG and non-state IG could play a role in these efforts. It was reasoned that with CEG, this would demand enhancement of conventional information flows, following pulling mechanisms that the multi-level information system must serve. Meanwhile, with non-state IG, novel information flows (and novel non-state actors) would provide pushing mechanisms that desire validation of credibility and legitimate representation of the Italian SSF circumstances. These different interactions with the multi-level information system were expected to result in various potential informational challenges. Thus, insight into these informational challenges and their effects on the state and non-state-supported reform of the multi-level information system was reasoned to logically indicate what can limit the recognition and inclusion of Italian SSFs. The resulting informed considerations in state and non-state-supported reform of the multi-level information system to meet this objective were expected to, in turn, also increase the likelihood of enhanced governance of legal and regulated Italian fishing practices.

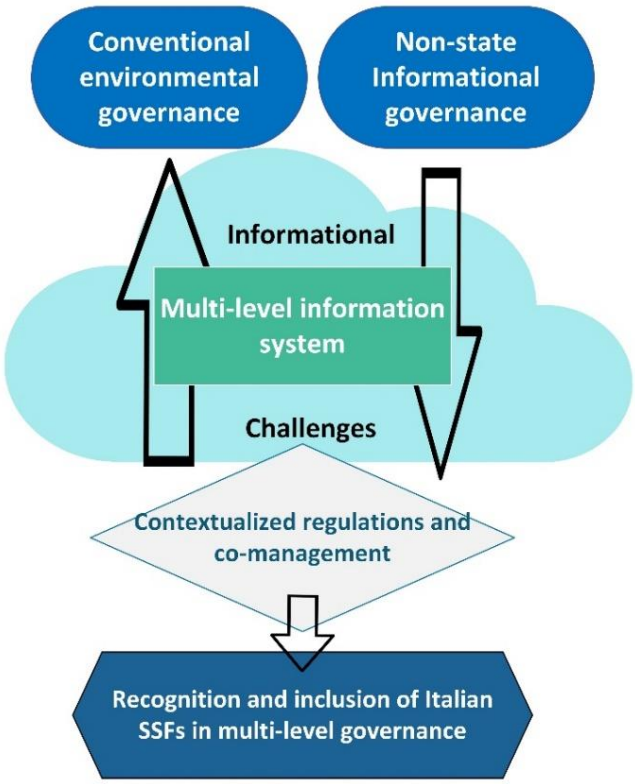

Figure 2: Conceptual model of the thesis, following a consideration of the paper of Song et al. (2020) with the theory of informational governance.

3. Methodology

This chapter discusses the research process, delineating the approach, methods, and tools used to answer the research questions. In *Section 3.1,* the general research design outlines the methodological approach and justification for this approach. *Section 3.2* discusses the steps to select the non-state approaches and interviewed experts. *Section 3.3* addresses how the literature review was performed. Similarly, the interview data collection process is provided in *Section 3.4*. How all collected data was organized is discussed in *Section 3.5*. *Section 3.6* presents the applied data-analysis methods that led to the research results. The chapter ends, in *Section 3.7*, with a reflection on ethical considerations maintained during the research.

3.1 Research Design

The research approach was based on a qualitative multi-case study design. The first research phase concerned a literature review that explored the currently applied CEG in Italian SSF governance, the multi-level information system, and Mediterranean non-state approaches. Phase 2 involved interviewing experts. Phase 3 included analysis and synthesis of data, applying thematic analysis, and triangulating findings.

As Grati et al. (2022) state, the governance of Italian SSFs can differ considerably. It was found that most literature reflecting on local differences was explored more efficiently by considering the different administrative regions first, as most literature considered such regions to be research areas. Thus, a multi-case study approach that focused on the sub-national and local scale of governance was applied. This approach is relevant to illustrate one issue with selecting multiple case studies (Creswell et al., 2007). An effective understanding of national, sub-national, and local differences and how they affect informational processes and systems on all scales of governance was considered crucial to understanding the bigger issue and general research subject, the recognition and inclusion of Italian SSFs in multi-level governance. This allowed for the identification of patterns and themes observed in multiple cases, facilitating a more holistic and nuanced understanding of how information on Italian SSFs is governed. Furthermore, all state-led multi-level information flows were analyzed to understand how they could facilitate the recognition and inclusion of Italian SSFs in multi-level CEG, and informational challenges could be expected when enhancing these flows. Expected informational challenges in validating novel non-state IG information flows were also analyzed. This allowed for a discussion of the effects of informational challenges on the reform of the information system through CEG and non-state IG-supported reform to facilitate the contextualization of regulations and co-management of Italian SSFs.

Internal validity was pursued to ensure meaningful research findings (Meijer et al., 2002). Bass et al. (2018) suggest that a multi-case research design may reduce credibility. Thus, data triangulation and peer debriefing were employed to ensure high internal validity for this part and all parts of the research (Creswell & Miller, 2000; Meijer et al., 2002). The triangulation of data sources took place by gathering findings from credible peer-reviewed academic sources. Furthermore, multiple experts were interviewed to allow for consideration of various attitudes. Secondly, peer debriefing took place by involving external individuals in the research process, improving credibility by reviewing the process and data, challenging conclusions and assumptions, and critically reflecting on chosen methods and interpretations (Creswell & Miller, 2000).

External validity was pursued to ensure that the resulting theories were also relevant to other marine governance cases (Findley et al., 2021). More specifically, to aid improvement in multi-level governance of SSFs in other GFCM -and coastal states facing similar situations. Bass et al. (2018) state

that high internal validity also facilitates external validity. Furthermore, patterns discovered in specific contexts were considered for transferability to other contexts. This chapter also provides a transparent and clear reflection on the research steps to ensure proven consistency and replicability of the research process. Data was also gathered with care and diligence and subjected to rigorous analysis. All accumulated findings were also grounded in data to ensure that they were not affected by biases or assumptions to ensure conformability.

3.2 Selection of Non-State Approaches and Research Participants

The selection of non-state approaches was based on their potential to facilitate co-management and the contextualization of regulations. Mediterranean approaches active in GFCM geographical subareas (GSAs), where Italian SSFs operate, were prioritized. Non-state approaches from other GFCM member states were also considered, prioritizing those in GSAs with a relatively higher proportion of SSF vessels to the total amount of active vessels. The top 5 GFCM member states with the most vessels are the Syrian Arab Republic, Greece, Lebanon, Cyprus, and Tunisia (FAO, 2021e; Pita & Gaspar, 2020). To manage the complexities of national differences in fisheries governance and non-state approaches, the selection process was limited to 34 hours. The first 16 hours were focused on Italian non-state approaches, followed by 10 hours divided equally among five other countries. Abstracts describing the principles of each explored approach were gathered, and the remaining 8 hours were allocated to assess the source with the following criteria:

1. **Demonstrated capacity to aid contextualized regulations and co-management of SSFs.**
2. **Mostly dependent on the capacity to aid production or verification of, and control over, information.**
3. **Active in more than two of the six countries**, indicating potential for successful application based on previous successes.
4. **Not limited to local situations**, ensuring applicability beyond the specific country encountered in Phase 1.
5. **Related to or adaptable to an institutional structure.** Naturally, the approaches needed to have the potential for alignment with Italian SSF governance. However, this was deemed extra necessary as Beddington et al. (2005) suggested that institutional systems create incentives for fisheries that result in practices that align with conservation objectives.

After selecting the non-state approaches, experts were interviewed on the topic of the approaches to aid the understanding of the approach, potential effectiveness, and capacity for facilitating co-management and aiding contextualized regulations. Following the purposeful sampling approach that Palinkas et al. (2015) recommends, organizations with greater relevance in multi-level governance were identified. Representatives of these organizations were approached and interviewed. Initially, the aim was to schedule interviews with English-speaking experts. However, Italian SSF operators and local representatives were also approached with Italian mails that were formulated with Google Translate (Naderifar et al., 2017). The remaining organizations were personally contacted to request a representative. The approach that Magnani et al. (2005) outlines was employed, considering the potential challenges in reaching busy representatives. Thus, approaching parties continued until the desired number of interview participants was reached. Additionally, at the end of all interviews, participants were asked for the contact information of other potential participants based on snowball sampling (Naderifar et al., 2017). *Table 1* presents the role of the interviewed experts at the highlighted associated organizations while mentioning other affiliations deemed relevant for the research. The work of each organization is discussed in the following chapters.

Table 1: Roles and associated organizations of interviewed experts

Role	Associated organizations
National President	**AGCI Agrital,** Vice-Chair MEDAC
Project Manager	**AMAP** (previously known as ASSAM)
Director of Research	**CNR-IRBIM,** Chair of CIESM Committee Marine Policy
Senior Researcher	**CNR-IRBIM,** ICES, STECF, GFCM
Marine Biologist	**Coldiretti Impresapesca**
National Manager	**Coldiretti Impresapesca**
Head of Sector – Unit Coast Guard and International Programmes	**EFCA**
Project Manager	**FEDERPESCA**
Fishery Officer for Socio-economic Issues	**GFCM**
Research member	**ICES** (Researcher at AZTI in Basque Country and expert on EU/Mediterranean SSF governance)
Head of Conservation, Management and Sustainable Use of Marine Resources	**ISPRA,** Co-chair of DG MARE Task Group Seafloor Integrity
National Manager Fisheries and Aquaculture	**Legacoop Agroalimentare**
Executive Secretary	**LIFE**
Fisheries Manager Italy and Greece	**MSC**
Senior Fisheries Program Manager	**MSC** (provided expert insights on ICCAT procedures)
Marine Program Manager	**WWF**

3.3 Literature Review Data Collection

The literature review aided the gathering of insights into the socio-ecological characteristics of Italian SSFs and how they are currently recognized in multi-level CEG through the multi-level information system. To gain insights into applicable modes of non-state IG, Mediterranean non-state approaches that could aid in contextualizing regulations and co-management of Italian SSFs were explored. This was approached by discussing and analyzing a range of literature, such as articles from academic journals, books, policy documents, conference proceedings, and other theses and dissertations. These sources were explored in academic databases like Google Scholar, Web of Science, and Scopus. The research also considered academic sources shared by research participants. Examples of search terms differed per objective behind the literature review attempt and are given below. However, regardless of the objective, all explored sources were screened and assessed by considering the relevance of the data to the research subject, objective, and questions.

Objective 1: Gather data on the multi-level information system of Italian SSFs

Examples of search terms: Italian fisheries information governance, Italian fisheries data, Italian multi-level governance, Italian fisheries and GFCM, Italian fisheries Mediterranean, Italian small-scale fisheries control, Mediterranean (and Italian) small-scale fisheries, etc.

Objective 2: Overview of Mediterranean non-state approaches

Examples of search terms (same for each of the selected GFCM member states in *Section 3.2)*: Italian context small-scale fisheries, Italian data small-scale fisheries, Italian non-state fisheries, Italian market initiative fisheries, Italian solution small-scale fisheries, Italian self-governance fisheries, Italian co-management fisheries, Italian evaluation small-scale fisheries, etc.

3.4 Interview Data Collection

Most interviews took place via Microsoft Teams. Three interviews were also performed in writing, and one was conducted via voice recording. All interviews were performed in English and followed a

semi-structured format to enable reciprocity between the researcher and the interviewee and a relaxed setting. This also allowed follow-up on the participants' answers with improvised questions while allowing for consistency in the interview data. These considerations followed the research of Kallio et al. (2016) to come to objective and credible interview guides. *Appendix I* reflects on these steps in the creation of an interview blueprint. Two versions of interview guides (*Appendix II*) were formulated to allow for different insights from the two interviewed groups. Still, both versions permitted the researcher to answer the overarching interview questions in *Appendix I*. However, one version was more focused on gaining insights into the activities of the selected non-state approaches. In contrast, the other version was more focused on gathering expert attitudes. All participants were asked if the interviews could be recorded and if they could provide feedback on the eventual transcripts. This followed the principle of member checking, as Candela (2019) describes, which allowed participants to confirm or deny the accuracy and interpretations of collected data, enhancing the internal validity of the interview data collection. After the interviews, all experts were provided with a formal consent form to indicate their preferred form of referencing their insights (i.e., by name or anonymously; see *Appendix III*). The first interviews were also reflected on to identify potential issues with the guide, after which potential adjustments were made to improve the execution of the subsequent interviews.

3.5 Data Management

All relevant literature sources were organized in a Microsoft Excel overview. Each reference had its details processed in descriptive columns, including publication year, author, URL, abstract, relevant text quote, and general topic. This systematic approach allowed for easy access, replication, and verification of sources. It also aided the processes of exploring observed patterns in the data.

All input and output data were stored and processed on the author's hardware to avoid privacy concerns. The resulting transcriptions were uploaded in Atlas.ti for coding and analysis. Codes were continuously reviewed, adjusted, and documented in a Codebook, ensuring consistent use throughout the research process. This facilitated efficient data analysis and interpretation. Not all experts consented to have their insights attributed by name, so each expert was assigned a randomized number. These numbers were used in reference to their insights when addressing attitudes regarding the effectiveness of CEG and non-state IG, selected non-state approaches, and expected informational challenges in the reform of the information system to facilitate the contextualization of regulations and co-management of Italian SSFs. However, a choice was also made to refer to experts' names when they provided insights related to organizations they were directly associated with (and when consent was received).

3.6 Data Analysis

The data analysis aimed to identify themes and patterns observed in the literature and interview results. The synthesis of these themes made it possible to answer the research questions. As Alhojailan (2012) suggests, this thematic analysis allowed for a detailed exploration of different subjects that contributed to a theory encompassing the research subject. The more frequent a pattern was observed on perceived informational challenges during interviews, the more credible it was considered when relating these patterns to insights from the literature review.

The interview data-analysis approach is based on the research of Green et al. (2007). With that, transcripts were thoroughly read multiple times to allow immersion and to identify patterns. Simultaneously, notes were taken in Atlas.ti, and key themes and quotes were highlighted in the transcripts. The coding process followed the methodology of Weicker et al. (2020) and relied on principles of priori and inductive coding. The priori codes were pre-considered and used as a

framework to analyze expected themes in the transcripts. They were based on the theoretical framework and the research questions in *Appendix I*. Examples of applied priori codes are: attitudes co-management CEG, attitudes co-management IG, etc. Other unanticipated observed themes were also labeled based on inductive coding. Lastly, all codes were grouped to analyze patterns by examining recurring themes in all interviews that showed shared and different attitudes between the experts.

3.7 Ethical Considerations

Before the research was performed, the author was already optimistic about the potential of non-state IG to improve fisheries governance and reduce Italian IUU fishing practices. Thus, there was a bias toward the outcome of the research. Furthermore, the author is employed by the Marine Stewardship Council (MSC) and is convinced that the program can drive sustainable global progress in the fishing industry. Still, the selection of the MSC, considered a non-state approach in the research, was based on the criteria in *Section 3.3*. Multiple sources were also utilized to ensure the findings were not solely based on personal attitude and bias. Additionally, the author sought feedback and input from colleagues and experts in marine governance to support credible reasoning.

The author also followed some principles of Govil (2013) when considering the ethics of this research. For example, the topic of effective IUU governance in the Mediterranean can be sensitive. Therefore, preventing negative consequences that could follow from this project was attempted by ensuring that all participants provided informed consent for processing their insights. Furthermore, if not necessary, the results only presented expert insights without explicitly citing the research participant. All contact details were also safely stored and not shared with anyone else.

During the research, the author considered a process of reflectivity when processing results that could be based on subjective meaning (Babones, 2016). This process followed the guidelines of Babones (2016) to ensure correct interpretation based on dialectical inquiry of what is indeed presented in the data. These guidelines were as follows:

a) The author will critically **construct measured concepts using observed variables.**
b) The author will critically **consider the commonsense meanings of those variables.**
c) The author will critically **analyze the research data.**
d) The author will critically **assess his ideological biases.**
e) The author will critically **consider the structural and historical forces that form the background of the research.**

The author did not intend to disregard the importance of the applied assessment methods and guidelines, as the eventual legitimacy and effectiveness of non-state approaches were deemed entirely reliant on the valid applicability to aid or facilitate the current governance processes to increase Italian legal, reported, and regulated fishing practices. In other words, there were no reasons to exaggerate the meaningfulness of a non-state approach because such exaggeration would only leave the approaches to be applicable on paper without any benefit to the problem at hand.

4. The Multi-level Conventional Governance System of Italian SSFs

This chapter navigates the landscape of state authorities and measures regulating and controlling Italian SSFs, addressing the scope of organizations providing the multi-level informational pulling mechanism the current information system must meet. Allowing for a better understanding of current efforts toward more contextualized regulations and co-management of Italian SSFs and which challenges could be expected in the reform to enhance and validate information flows. It also provides context to the role of some interviewed experts presented in *Table 1*. Furthermore, it aids the explanation of informational challenges that relate to these actors and instruments in the following chapters.

Policy actors and instruments directly affecting Italian SSF governance are pooled by governance scales in which they are primarily active, starting with the international scale (*Section 4.1*), moving to the national and sub-national scale (*Section 4.2*), and ending at the local scale (*Section 4.3*). Conclusive remarks on the CEG system and its interaction with Italian SSFs are given in *Section 4.4*.

4.1 International Governance of Italian SSFs

Italy is an EU member state and, therefore, is subjected to the EU's legislative framework (European Commission, n.d.-h; European Union, n.d.-b). The EU has a large mix of policy actors and instruments that affect SSF governance. This section reflects the scope and complexity of these international actors and instruments driving pulling mechanisms for information in the CEG system of Italian SSFs.

The Common Fisheries Policy (CFP) governs all EU fisheries, with common rules that are decided on an EU level and applicable to all Member States (European Parliament, 2023). In general, the CFP calls attention to ecological and socio-economic fisheries dimensions, enforces the need for catch limits that follow from fish stock management at maximum sustainable yield (MSY) for all European managed stocks, enforces a landing obligation (of certain species with specific features), and mandates fleet capacity ceilings for each EU country (European Commission, n.d.-b). The CFP is formulated by **DG MARE**, which is the department of the **European Commission** that formulates all EU policies relating to fisheries and other maritime affairs (Cardinale et al., 2021). This department is responsible for reaching the CFP's objectives to ensure that EU fisheries are natural, renewable, movable, and common property as part of the EU common heritage (European Parliament, 2023). To support these objectives, DG MARE also proposes multi-annual management plans for the most commercially important EU fish stocks and fisheries, each containing their objectives to manage certain stocks and containing specific conservation rules (European Council, 2022a; Lado, 2016). For Italian SSFs, the **Western Mediterranean MAP** is relevant, as it includes technical and legislative measures to revitalize depleted key demersal stocks and ensure environmental and socio-economic stability for Italian fisheries (European Council, 2019b).

Following rules of the CFP and formulated multiannual plans, DG MARE also proposes annual catch limits in the form of **Total Allowable Catches (TACs) and quotas** that are shared between member and non-member states that share fish stocks in their Exclusive Economic Zones (EEZs) (European Commission, n.d.-e). Still, the literature suggests that the CFP predominantly considers large-scale fisheries (LSFs) when formulating management measures and evaluations intended to fit the lesser number of particularities of LSFs while overlooking the more specific and more extensive set of socio-ecological characteristics of SSFs (Percy & O'Riordan, 2020; Raicevich et al., 2018). Furthermore, TAC and quota systems have been mainly considered ineffective in fisheries catching a wide range of species (Idda et al., 2009). Indeed, this means that fisheries cannot easily shift from the catch of one species to another when quotas have been reached. This is also why Italian SSFs are

not subjected to adherence to internationally formulated output restrictions, quotas, or TACs, except when catching some sedentary species or highly migratory species such as bluefin tuna (Ganapathiraju et al., 1995). This provides an example of previously performed contextualization (based on SSF characteristics shared throughout the Mediterranean). Such contextualization could also be found in the later formulated Mediterranean exemptions to the already-implemented **landing obligation (LO)** for many species that Italian SSFs targeted. Initially, the LO stipulated that all species regulated through catch restrictions or minimum landing sizes (MLSs) must be landed and counted against Individual Transferable Quotas (ITQs) (European Commission, n.d.-c). This demands that fishers retain such caught species onboard until landing, reducing the storage for other catches. Also, the time invested in sorting the catch reduces economic efficiency (Delegated Regulation (EU) 2017/86, 2019). Upon recommendation of the **Scientific, Technical and Economic Committee for Fisheries (STECF**; see *Section 6.2* for their role in the information system), associated costs that Italian SSFs experienced due to the LO were considered disproportionate to the small catch quantities and too challenging to adhere to due to multiple landing spots, resulting in the exemption for a long list of species including Venus shells *(Venus spp.),* common sole (*S. solea*) and European seabass (*D. labrax*) (Delegated Regulation (EU) 2017/86, 2019).

Plans proposed by DG MARE are negotiated and adopted as laws by the **EU's Agriculture and Fisheries Council configuration (AGRIFISH)**, which is mainly done with the **European Parliament** (European Council, 2022b; European Union, n.d.-a). Within AGRIFISH, this is executed by ministers of each EU member state. Depending on the topic discussed, the appointed minister to partake in these meetings can have different ministerial backgrounds (European Council, 2023). As such, these Italian ministers would need to be well-informed on national SSF characteristics to ensure that laws can be adhered to by the SSFs they represent. Likewise, 76 Italian-elected members of the European Parliament have to vote on the plans (European Parliament, n.d.-a, n.d.-b). The European Parliament members are informed of the evaluations of the proposals by their **Committee on Fisheries (PECH)**, which is responsible for the in-depth evaluations of proposals that concern changes to fisheries governance (European Parliament, 2017a). This committee has 53 members (substitutes included), nine of whom are from Italy (European Parliament, n.d.-c). This all raises the question of how effectively the transfer of information concerning all Italian SSFs is taking place. Furthermore, it is unclear how political influences, as described by Ramírez-Monsalve et al. (2021), following from different nationalities, are mitigated to ensure a correct representation of Italian SSF characteristics in these legislative processes.

A motion for a resolution of **the European Maritime Fisheries and Aquaculture Fund (EMFAF)** has been adopted as a non-legislative act by the European Parliament in May of 2023 (Resolution on Co-Management of Fisheries in the EU, 2023). With that, a framework was shared with DG MARE, in which they must formulate and adopt proposals that can provide administrative, economic, and advisory tools that are needed for the Member States and the fishing industry to effectively adopt co-management models (EU Monitor, n.d.; Resolution on Co-Management of Fisheries in the EU, 2023). Thus, this indicates interest on an international scale in support of co-management. However, at the time of writing, it was still unclear how DG MARE would define these necessary informational tools and how this could affect the recognition and inclusion of Italian SSFs into multi-level governance.

Once the European Council and Parliament have passed proposed legislation of DG MARE, it is shared as a management decision with the **GFCM**. As the RFMO of the Mediterranean, they must ensure that these management decisions are adhered to by the GFCM member states (European Parliament, 2012a). The importance of the GFCM follows from the consideration that fishing

activities in the Mediterranean predominantly exist off SSFs with a multi-species, multi-gear, and multi-landing sites approach (European Parliament, 2012a). These features also make enforcing a management approach based on TACs difficult, as these are agreed upon for individual stocks and divided over EU member states (Casey et al., 2016; European Parliament, 2012a). Therefore, the GFCM enforces decentralized decision-making and establishing multi-annual management plans in Italy on a national and community scale, which must be based on principles of good governance and formulated by applying a bottom-up approach (European Parliament, 2012a). The GFCM also holds the power to establish binding recommendations about the conservation and management of their member states' fisheries (Ünal & Ulman, 2020). For these recommendations to be binding, they must pass as EU law, too (European Parliament, 2023a). The resulting measures can concern regulating fishing techniques, gear, MLSs, spatial and temporal closures, and fishing effort control (Simard et al., 2014; Ünal & Ulman, 2020). **The International Commission for the Conservation of Atlantic Tunas (ICCAT)** also has the authority to propose binding recommendations for their contracting parties, like the EU (European Parliament, 2017b; ICCAT, n.d.). However, their recommendations are specifically related to the conservation of tuna and tuna-like species in the Atlantic Ocean and adjacent seas, like the Mediterranean Sea (Simard et al., 2014). Indeed, these measures also include maximum catch limits and quotas for some highly migratory species (European Parliament, 2017b). Furthermore, they differ from the GFCM, with a more directly effective enforcement. Once adopted, ICCAT resolutions must be met by GFCM member states, while GFCM recommendations leave more room for consideration of national, sub-national, and local circumstances in management plans (Spagnolo, 2010). As follows from Pascual-Fernández, Florido-del-Corral, et al., (2020a), once the EU adopts these recommendations into law, countries must distribute the resulting TACs for these species over their fleets. This shows that international regulations can also differ in their enforcement, with the recommendations of the GFCM providing more flexibility than those of the ICCAT. This also indicates that challenges might be more prominent when ICCAT regulations are not effectively contextualized. As also follows in *Section 6.3.1*, the GFCM also provides platforms for Italian SSFs to represent challenges they face following ineffective governance. The absence of literature suggests that ICCAT does not prioritize the contextualization of regulations, impeding the flexibility of adjusting imposed (and ineffective) SSF governance.

The GFCM and ICCAT also collaborate with the **European Fisheries Control Agency (EFCA)** (EFCA, n.d.-b, n.d.-a). This is an EU agency with the primary objective of ensuring the highest shared standard for control, inspection, and surveillance relating to the enforcement of measures following the CFP. It does this by organizing collaboration between national control and monitoring activities. However, they also provide similar support to enforce measures from the GFCM and ICCAT (EFCA, n.d.-b, n.d.-a). For GFCM members, they also provide workshops to improve the inspection and control activities and provide overall assistance in the "fight against IUU fishing". They also support DG MARE as serving as an EU delegation in GFCM meetings and working groups concerning monitoring and control legislation (EFCA, n.d.-a). Most of the control effort in all the EU waters occurs in the Mediterranean. Their sea-based control effort increased from 3058 to 5010 days between 2020 and 2021. In comparison, the Black Sea received the second-most control effort, with 612 days in 2021 (EFCA, 2022). This also translates to an increase in financial costs in the Mediterranean control effort, which increased by 53% between 2020 and 2021. The EFCA also performs "Mediterranean Specific Campaigns", of which most take place in Italian waters (118 patrol sea days in 2022; outside of 1135 other patrol sea days) (EFCA, 2022).

Notably, considerable provisions in the recently approved Regulation (EU) 2023/2842 (2023) will fall under the control of DG MARE and the EFCA through a more authoritative demand for fishery data. This regulation explicitly focuses on strengthening "the fight against IUU fishing" and aims to control

fishing activities through a complete digitalization from fish catch to commercial activities. For Italian SSFs, this means that they will be mandated to be tracked via a Vessel Monitoring System (VMS) and that their products must be fully traceable along the supply chain. SSF vessels may be exempt until 2030, and fleets have up to four years to adapt to the new conditions. The expected necessary preparatory work also suggests that AGRIFISH and the European Parliament foresee some informational challenges that must be overcome first. Indeed, some expected informational challenges were also identified by interviewed experts and discussed in *Sections 6.1.2 and 7.3.4*.

This all already indicates the considerable international state-led informational effort needed to control IUU fishing activities in Italian waters and raises the question of whether a state and non-state-supported information system reform could, ultimately, reduce these efforts and associated financial costs. On the one hand, this question could be related to a theoretical decline of necessary criminalization efforts, which Song et al. (2020) also suggested. Indeed, Italian SSFs are less likely to be considered criminal when their particularities are better understood. On the other hand, it might be reasonable to assume that enhanced information flows and novel state-endorsed information flows would increase the level of available and accurate information about the activities of Italian SSFs, also allowing for more effective control efforts of the EFCA and national control authorities.

4.2 National and Sub-national Governance of Italian SSFs

As mentioned, DG MARE enforces the definition of national and sub-national management plans for vulnerable fisheries in EU waters. These management plans encompass: 1) a specific list of authorized fishing vessels; 2) detailed specification of vessel technical attributes; 3) designated timeframes for fishing activities; 4) technical measures for approved fishing gear and techniques; 5) prescribed conservation and protection measures (Pascual-Fernández, Pita, et al., 2020). These measures follow established national conservation reference points to maintain the exploited populations at sustainable levels. Still, these management plans are only adopted within the EEZs of each EU member state, without considering the transboundary dimension of most exploited populations in the Mediterranean Sea (Cardinale et al., 2017). The size of the Italian fleet follows strict EU entry-exit regulations based on fishing capacity measured in tonnage and power (Vindigni et al., 2016). These regulations dictate that an equivalent reduction must balance any increase in a country's fishing fleet capacity. This also means that licenses for Italian SSFs limit the growth of this fleet segment. At the same time, unlicensed fishing with new vessels and gears continues to increase the number of illegal fishing (Vindigni et al., 2016). It should be noted that DG MARE, AGRIFISH, and the European Parliament have the authority to supersede national and regional plans, as happened in 2019 with the implementation of **Western Mediterranean MAP.** This was partly implemented, as national governance was observed to support conservation objectives insufficiently (European Council, 2019a).

Indeed, this already shows the influence of international policy actors and instruments on the national and sub-national governance of Italian SSFs. This section will further address this relation and show the relationship between key national and sub-national policy actors and instruments, adding to the complexity of the informational pulling mechanisms in the CEG system of Italian SSFs. Relevant national policy actors are ministries, port authorities, and control centers. These actors also affect sub-national governance. However, sub-national policy actors also have their own ministerial departments to perform fisheries governance and even utilize the services of external agencies. This section considers whether these sub-national differences in governance impede international and national governmental objectives through the effectiveness of collaboration and/or delegation.

The **Ministry of Agriculture Food and Forestry** (**MiPAAF** - Ministero delle Politiche Agricole

Alimentari e Forestali) is responsible for allocating national TACs and formulating and coordinating national management plans in response to international regulatory guidelines (MiPAAF, n.d.). It also represents the national interests of the fishing industry in relations with the EU, GFCM, and other international organizations (MiPAAF, n.d.). Furthermore, the MiPAAF processes applications to fund fishing activities through the EMFAF. They also coordinate national research projects in the fishing industry and data collection to meet EU requirements for stock assessments (MiPAAF, n.d.). Furthermore, they coordinate the control of fish product quality and the demand for necessary Monitoring, Control, and Surveillance (MCS) activities performed by the **Port Authorities – Coast Guard** and the **National Fisheries Control Centre (CCNP)** (MiPAAF, n.d.; Tudini, 2014). The Coast Guard is well-established and spread out along the coastline to oversee all Italian fishery activities, the trading of fish products, and the verifications of any non-adherence to laws and regulations (Tudini, 2014). Furthermore, the CCNP monitors all fishing activities, enforces regulations, and maintains the National Register of Infringements related to the CFP. It also collaborates internationally with the EFCA to improve fisheries management (Capitanerie di Porto - Guardia Costiera, 2015).

Most Italian fishing regulations follow the technical measures of the European management plans. The most characteristic features are national measures to support conservation objectives (FAO, 2024a). Each management plan has measures that address the impact on the primarily targeted stocks and fishers' income (FAO, 2024a). Still, most national management plans seem to have been mostly constructed with Italian LSFs in mind. This is also exemplified by the fact that most of these plans were directed toward active fishing gear in 2015 (FAO, 2024a). Administrative regions also hold decision-making power, as delegated by the national authorities (Pita et al., 2021). For example, Sicily has its own Fisheries Department, which is part of the Regional Ministry of Agriculture and Food Resources. In this role, it focuses on fisheries research, creates conservation measures, manages allowed fishing gear and techniques, oversees fisheries closures, and promotes cooperation among fishers. These measures can be different if they do not weaken internationally imposed limitations. This shows that national and sub-national management plans cannot include less stringent measures recommended in international management plans. However, this also suggests that contextualization of regulations on an international level does not necessarily result in related national and sub-national regulations that are just as contextualized, as these can be different and more stringent than international ones.

Still, sub-national authorities have also formulated specific agencies that can serve as operational public bodies and mediators between SSFs and research institutions. For instance, the **Agency for Innovation in the Agri-food and Fisheries Sector (AMAP; "Marche Agricoltura Pesca"**) holds the authority to manage projects supported by the EMFAF in the region of Marche. Furthermore, they provide certification, traceability, and analysis services for seafood products. As such, they contact local SSFs to motivate the banding together in consortia. They also aid performance studies (e.g., regarding testing of tools for participatory governance) and mediate between SSFs, research centers, and other institutions to work together. Furthermore, they work together to formulate more local plans (this general process is discussed in the following section). Thus, these efforts already seem to imply that some administrative regions are ambitious to enhance the contextualization of regulations and facilitate co-management.

However, it is unknown to which extent such sub-national ambitions can also be found in other administrative regions, while Pita et al. (2021) also addressed that sub-national differences have resulted in challenging situations. They addressed that such differences can be found in consideration of similar fisheries that target the same fisheries but in different administrative

regions, causing challenging discrepancies between the multiple levels of governance efforts. On the one hand, it has been found that such discrepancies might favor Italian SSFs. For instance, Italian eel fisheries were considered to be banned in 2009 in a national management fishery plan. However, some administrative regions created their own Regional Management and Protection Plans, which allowed them to be exempted from a total ban (Tudini, 2014). On the other hand, *Cases 1 to 4 in Section 5.3* indicate how this can cause sub-national differences in governance, resulting in seemingly unfair balances in demands following regulations and opportunities to facilitate co-management that differ per administrative region.

4.3 Local Governance of Italian SSFs

Following European Council Regulation (EC) 1198/2006, national state authorities can delegate power to local areas, encouraging co-management (Raicevich, Grati, et al., 2020). This is based on the concept of **Territorial Use Rights for Fishing (TURFs),** which is a tool for fisher communities to delimit a territory as their own. The following steps must be taken to define a TURF: 1) the local authority responsible for implementing the EU fishery funds initiates a proposal toward the fishing industry to draft a **Local Management Plan (LMP)**; 2) management consortia of fisheries **(CO.GE.PA; "Consorzi di indirizzo, coordinamento e gestione tra imprese della piccola pesca artigianale"**) must be present or formed that includes at least 70% of the local fisheries and that agree with regulatory requirements and the delineation of the designated area.; 3) collaborating with one or more research institutions, the CO.GE.PA engages its members in formulating goals and regulating the LMP; 4) the LMP, following state guidelines, addresses critical concerns related to socio-ecological sustainability. It puts forward solutions and projects aligned with current multi-scale regulations and receives priority consideration for receiving European funding; 5) a panel of scientific experts appointed by the management authority assesses the LMP and, if endorsed, submits it for adoption by the MiPAAF; 6) the MiPAAF officially adopts the LMP and its associated regulations by issuing a Ministerial Decree. This gives the administrative regions the weight of law and subjects them to monitoring and enforcement by law enforcement agencies; 7) research institutes evaluate the plan for three years, with an annual report on the progress of activities, and formulate possible recommendations for adjustments together with the CO.GE.PA.

LMPs are intended to regulate the fishing zones, restock exploited areas, and establish fishing calendars, and they can be implemented in other multi-level regulations (Raicevich, Grati, et al., 2020). Such plans contain regulations that must be more stringent than existing state regulations and can concern technical limits such as mesh size, the dimensions of fishing gears, voluntary fishing suspensions, and fishing closures in nursery areas (European Parliament, 2012b). All regulations demand close coordination with relevant public administrations, which approve the LMP and oversee the enforcement through regular surveillance activities of police forces. The reason for this external surveillance stems from the procedure of implementing TURFs (European Parliament, 2012b). Even though regulations within LMPs follow consultation of local fishers, the rules must be adopted at a central level to be considered law. This also allows the rules to subject members of fisher consortia and extend to external parties (European Parliament, 2012b). Indeed, this shows that LMPs are an example of co-management, as defined by Jentoft et al. (1998), as they allow for collaborative and participatory decision-making processes among Italian SSFs and imply their autonomy within the overall institutional CEG system.

The role of CO.GE.PA in governance is consultative and defined by Italian law 41/1982. The Italian Ministerial Decree 14/9/1999 specifically emphasizes the supported establishment of consortia (Raicevich, Grati, et al., 2020). This has been formulated with the following roles: 1) the suggestion of LMPs, 2) the active involvement in control and surveillance activities, and 3) the creation of

frameworks to bolster production efforts and increase the worth of capture resources. While Raicevich, Grati, et al. (2020) also suggest that the CEG could more effectively support these roles, the involvement of CO.GE.PA in the formulations of LMPs has been fundamental to successful results. For instance, with support from the national administration, an LMP has been adopted in Sicily to revitalize fishing practices and establish collaborations between fishers, institutions, and scientists (Raicevich, Grati et al., 2020). It was found that Sicilian fishers were experiencing challenging socio-economic circumstances due to perceived difficulty in facing increased regulations and prohibitions and competition with illegal and recreational fishing. According to Battaglia et al. (2017), such issues have been somewhat reduced by implementing LMPs, with examples of collaboration between CO.GE.PA and research institutions to formulate credible conservation measures (e.g., gear size limits, assigned fishing zones, etc.) or mechanisms to monitor biological, economic, and social indicators (Raicevich, Grati, et al., 2020). Thus, LMPs can be an example of holistic and sustainable fisheries management on a local scale, which also serves to coordinate administrative bodies and monitoring authorities (Raicevich, Grati et al., 2020). TURFs with effective LMPs can remove the common property features of exploited stocks that often lead to unsustainable competition and overexploitation (Raicevich, Grati, et al., 2020).

All this suggests that the active involvement of local Italian SSFs in co-management can also serve multi-level conservation and IUU objectives. **Community-led local development (CLLD),** which considers practically the same elements as the process of formulating LMPS to implement TURFs, has also been considered as containing essential tools for the programming period 2021-2027 of the European Structural and Investment Funds (ESIF; among which being the EMFAF) (Grati & Perretta, 2022). More specifically, this CLLD relies on formulating **Fisheries Local Action Groups (FLAGs)** to support the CFP. These FLAGs concern organizations from the private sector, local authorities and civil society to work on a local plan to address a specific area's economic, social, and environmental issues (Grati & Perretta, 2022). Thus, local governance in Italy is, to some extent, already motivating state-endorsed co-management. Indeed, SSFs (and the FLAGs they partake in) can also receive national and international support through funds from the ESIF. Still, as also follows from discussed informational challenges in *Chapters 6, 7, and 8*, the multi-level ambitions and governance framework for co-management should not immediately be considered to result in the effective facilitation of co-management, as challenges still occur in the implementation processes.

4.4 Conclusive Remarks on the Italian SSF Governance System

The current SSF governance system exemplifies the principles of CEG, with a large set of policy actors and instruments that respond to conventional authoritative forces and state power, as Mol (2006) described. Activities in this system are highly intertwined and interdependent, showing the complex path that multi-level regulations must follow before they get implemented. The notion that so many steps are needed might also suggest that the contextualization of regulations and the facilitation of co-management is impeded, as information might get diluted or not reach the right actors at the right time. This all raises the question of how the transfer of information is effectively taking place. This challenge also seems to be partly addressed by the recent implementation of Regulation (EU) 2023/2842 (2023), through a more authoritative demand of information. While Italian SSFs will be affected by this regulation relatively later than other fleets, the notion that SSFs get more time to prepare for these changes might also indicate that some informational challenges are expected in the implementation. Furthermore, it is unclear how political influences, as described by Ramírez-Monsalve et al. (2021), following from different nationalities, are mitigated to ensure a correct representation of Italian SSF characteristics in these legislative processes. These and other informational challenges are discussed further in *Chapters 6 and 8*.

Still, the CEG system does show capacity for contextualization of regulations, as policy actors and instruments also recognized the challenge of Italian SSFs when the LO was enforced, resulting in exemptions for a considerable list of species. A similar challenge was recognized in adhering to quota, leading to the exemption from adherence to internationally formulated output restrictions, quotas, or TACs for most species they catch. Interestingly, it has also been found that sub-national governance can be less stringent than national governance. In contrast, both national and sub-national governance can never be less stringent than international regulations. This also means that contextualizing international regulations does not necessarily result in subsequent national and sub-national regulations that are just as contextualized, as these can be different and more stringent than international ones. Theoretically, if ICCAT recommendations were deemed insufficiently contextualized and an adjustment toward more contextualization took place, Italy and any of its regions could still choose to maintain the recommendations that ICCAT changed. Still, it has also been found that adjusting ICCAT recommendations to take such an approach is likely less efficiently pursued than with GFCM recommendations, as Italian SSFs only seem to have been provided platforms to raise their concerns and issues by the GFCM. Notably, ICCAT recommendations also desire direct enforcement with less flexibility than the GFCM recommendations, of which national and sub-national authorities also consider the implementation. This raises the question of whether Italian SSF concerns are sufficiently considered in regulations resulting from ICCAT recommendations. Especially since regulations surrounding quotas for pelagic species remain a point of contention, as follows from sub-national challenges that Italian SSFs face (see *Case 2 of Section 5.3*) and informational challenges surrounding the formulation of contextualized quota regulations as presented in *Sections 6.1.2 and 6.2.2.* Indeed, these sections provide an example of sub-national differences in governance, which result in a seemingly unfair balance in the contextualization of regulations and co-management of Italian SSFs.

It has also been found that the CEG system already promotes the notion of co-management of Italian SSFs, resulting in local successes, as exemplified in Sicily. However, this only concerns the governance framework. The fact that the European Parliament called for formulated and adopted proposals to provide administrative, economic, and advisory tools to support EU member states in utilizing this framework already indicates some expected informational challenges in the implementation processes. Notably, seven steps must be taken in the implementation processes of co-management schemes, which all provide stages to invite unique informational challenges. Questions can, for instance, be raised on how CO.GE.PA are facilitated as they play a critical role in the facilitation of co-management. Thus, while international interest in supporting co-management has been shared, it is still unclear how DG MARE would define the necessary tools and which informational challenges they considered. It seems likely that some of the informational challenges addressed in *Chapters 6, 7, and 8* should also benefit from these tools to ensure that co-management can be effectively facilitated for all Italian SSFs.

This chapter has described the current multi-level governance system. With this context in mind, the following chapter will discuss the challenges that Italian SSFs face due to the ineffectiveness of this system. Likewise, it addresses the characteristics of Italian SSF as an indication of what creates or motivates some of the informational challenges that experts identified in *Chapters 6, 7, and 8*.

5. Characteristics and Challenges of Italian SSFs

This chapter presents Italian SSFs by discussing their socio-ecological particularities and the challenges they face due to ineffective governance. Because of sub-national and local differences, case studies described in marine governance literature have been used as the primary source to show the difficulties in aligning the variance of SSF contexts with a complex governance system to come to the adequate contextualization of regulations and co-management of Italian SSFs.

In *Section 5.1*, the defining characteristics of Italian SSFs are provided, as well as the associated challenges in assigning them with one all-encompassing definition. *Section 5.2* discusses the socio-economic characteristics of Italian SSFs, indicating their value and vulnerability to ineffective governance. *Section 5.3* provides cases of failed recognition of Italian SSF characteristics in governance, as well as sub-national and local differences, to indicate the challenge of recognizing multi-specific characteristics and the inequity that Italian SSFs face amongst each other when it comes to differences in governance. The chapter ends with *Section 5.4,* which provides conclusive remarks on the characteristics and challenges of (recognizing) Italian SSFs.

5.1 Defining Italian SSFs

The previous chapter discussed the complex multi-level CEG system and raised questions regarding the recognition of Italian SSFs in current governance processes. As Calò et al. (2022) suggest, this system has been ineffective in this regard. They noted that Mediterranean SSFs have historically been neglected and marginalized compared to more industrial fishing sectors, disregarding the economic, social, historical, and cultural significance of SSFs at all levels of governance. Even with the decentralized approach of the GFCM, the notion that governance processes have been insufficient in effectively considering the voices and particularities of Italian SSFs is quite widely agreed upon in literature (Pascual-Fernández, Florido-del-Corral, et al., 2020a; Raicevich, Grati, et al., 2020). According to Grati et al. (2022), it is the Italian SSFs that are more likely to partake in IUU incidents. This also follows Song et al. (2020) and the consideration of historically ineffective recognition, as it might be that the relatively higher likelihood of criminalization also follows from how the CEG-driven multi-level information system has recognized Italian SSFs in governance processes. This section explains how Italian SSFs can be defined with shared characteristics while indicating the challenge of assigning them with one all-encompassing definition.

The definition of an SSF does not hold a general scientific consensus. For instance, the FAO Fisheries Glossary considers traditions, the involvement of fishing households, lower amounts of capital and energy, relatively smaller-sized (or the absence of) vessels, shorter durations of performed fishing activities, nearness to shores, and whether the catch is meant mainly for local consumption (Grati et al., 2022). In contrast, the CFP and the European Maritime and Fisheries Fund (EMFF; predecessor of the EMFAF) define SSFs as “fishing carried out by fishing vessels of overall length of less than 12m and not using towed gear”(European Commission, 2017; Grati et al., 2022; Pascual-Fernández, Pita, et al., 2020). Italian state authorities endorsed this definition, while Italian SSFs have also proven their capacity to implement low-impact towed fishing gear with limited technological input (Raicevich, Grati, et al., 2020). According to Raicevich, Grati et al. (2020), these decisions were mainly intended to improve the sustainability of LSFs but also affected SSFs with considerable local challenges. The application of the new EMFAF seems to have shifted how SSFs are considered, as they can now apply for funding that is reserved for small and medium-sized fishing vessels (less than 24m in length), with vessels not exceeding 12m (without identified gear types) receiving more funds for approved projects (European Commission, 2021). This research only considered SSF data that

follows the definition of the EMFF unless stated otherwise. With that in mind, SSFs are present within every riparian, administrative region of Italy (Raicevich, Grati, et al., 2020). However, their distribution is considerably uneven, and the number of fishers operating these small-scale vessels increases when going southwards, as shown in *Figure 3.*

Figure 3: Map showing the absolute number of Italian fishers operating SSFs per region (Raicevich, Grati, et al., 2020)

Most Italian SSFs operate within a short distance from the coast and relatively near their home harbors. They utilize low-power engines and are often operated by a single fisher, usually the owner, or a small group of family members. From 2013 to 2015, 43% of all Italian SSFs utilized trammel nets, 37% employed gillnets, and 8% utilized set longlines, indicating a preference for more passive gears (Raicevich, Grati, et al., 2020). As a license allows vessels to use multiple gear types (97% can adopt static nets, 70.6% longlines, 37.8% hooks and lines, 17.3% surrounding nets, 6.4% small driftnets, and 6% harpoons), these are used reactively to local and temporal conditions (Raicevich, Grati, et al., 2020). They catch an extensive range of target species (about 140 species in 2016). However, European anchovy (*E. encrasicolus*), sardine (*S. pilchardus*), venus clam (*C. gallina*), European hake (*M. merluccius*), deep-sea pink shrimp (*P. longirostris*) and striped mullet (*M. surmuletus*) contribute to about 50% of landed volumes and provide the highest and most stable catches and revenues over time (Calò et al., 2022; Raicevich, Grati, et al., 2020). Furthermore, the utilization of passive gears differs per administrative region, with some showing a more extensive diversification of utilized fixed net gear types (Calò et al., 2022). Historically, Italian SSFs are known for selling and consuming non-target species, which is in contrast to the characteristics of LSFs. (Calò et al., 2022). This, combined with an average higher level of selectivity, is likely also why Italian SSFs have moderate levels of discards compared to LSFs (Bousquet et al., 2022; Sardo et al., 2023).

The extensive range of catch species and techniques are often considered to provide Italian SSFs with relatively better adaptability to climate change than other fleet segments (Calò et al., 2022). This would be especially beneficial in the Mediterranean Sea, as the increase in sea surface temperature has surpassed global averages (Denaxa et al., 2023; Lee, 2023). Climate change also increases the presence of non-indigenous and thermophilic species that compete with traditionally targeted species (Raicevich, Grati, et al., 2020). Italian SSFs are also often highly dependent on a few economically and locally essential species (Calò et al., 2022). Reduced mobility to change exploited

areas also increases their dependence on local ecosystems and exposes them more to the effects of stressors such as climate change, market fluctuations, and overfishing. Hence, as Calò et al. (2022) also suggest, Italian SSFs' properties are often assumed but not broadly confirmed, increasing the risks of implementing management strategies that create socio-ecological disparities.

5.2 Socio-economic Characteristics and Challenges of Italian SSFs

While only accounting for relatively little of the total Italian landings, SSFs have played a significant role in local coastal communities' cultural and ethnographic values (Raicevich, Grati, et al., 2020). Penca et al. (2021) also emphasized that the traditional ecological knowledge of SSFs has been vital in maintaining coastal communities. Thus, the social importance that Italian SSFs have in the community is a characteristic in itself, which must be effectively recognized to facilitate contextualized regulations, as described by Jentoft (2007). However, this section will also dive deeper into other socio-economic characteristics and challenges related to ambitions, stakeholder interactions, market situations, and existential threats. It does this by combining literature and gathering expert insights to understand better what must be recognized in efforts to contextualize regulations regarding their socio-economic importance and how their livelihoods can be threatened when such contextualization is ineffective.

5.2.1 Socio-economic Characteristics and Market Challenges

The Italian SSF industry is considered the biggest Italian fishing segment, accounting for 30% of capture-fisheries revenues and 55% of capture-fisheries employment (Di Cintio et al., 2022; Raicevich et al., 2018). Still, the total amount of catch landed by Italian SSFs represented only 25% of the total landings between 2013 and 2015 (Raicevich, Grati, et al., 2020). Furthermore, their role is considered relatively limited within the Italian economy, but this also follows the relatively small impact of the entire Italian fishing industry, only representing 0.30% of Italy's Global Domestic Product (GDP) in 2015 (Raicevich, Grati, et al., 2020). According to Raicevich, Grati, et al. (2020), this stimulates ineffective recognition of the SSF industry's importance in local economies. As a result of governance efforts to reduce the fishing activity of the Italian SSFs and LSFs, both industries have reduced the number of vessels, gross tonnage, and power in recent years (Raicevich, Grati, et al., 2020). While this did not result in significant improvements in the health of exploited stocks, SSFs did experience worse economic performances (declines in gross value added, gross and net profit, and profitability indicators) than the LSF industry from 2008 to 2014 (Raicevich, Grati, et al., 2020).

Lack of Market Bargaining Power

Indeed, economic crises have also negatively affected SSFs through fluctuations in market demand, price volatility, and escalating fuel costs (Prosperi et al., 2019). Decreasing numbers of SSF operators also causes fragmentation, leading to individuals facing isolation with decreased market negation power (Prosperi et al., 2019). Sardinian, Sicilian, and Apulian SSFs were already found to receive significantly less economic benefits from their catch, with wholesalers and fish shops being rewarded with the highest sale prices (Di Cintio et al., 2022). SSFs also show high dependence on seafood shops and wholesalers to market catch and buy ice, boxes, and bait. Legitimate SSFs also experience high competition in the form of internationally traded products and illegally sold products (caught by non-licensed and non-professional fishers), which drive the prices down (Di Cintio et al., 2022; Penca et al., 2021). Furthermore, the lack of organization and collective capacity of SSFs often results in a lack of influence over prices (Penca et al., 2021). Their lack of influence over prices and potentially decreasing revenues can motivate the search for ways to compensate for losses, such as increasing fishing efforts (Penca et al., 2021). As such, markets can also drive feedback loops that motivate unsustainable SSF practices (Calò et al., 2022; Penca et al., 2021).

Challenging market situations occur in all Italian administrative regions (Penca et al., 2021). For instance, most Aeolian SSF vessels were registered under eleven fishing cooperatives. Still, they did not have a collective trade agreement or shared product qualification strategy, while most other catches entered the wholesale industry (Battaglia et al., 2017). Thus, industrial players also have considerably larger bargaining power. Furthermore, Battaglia et al. (2017) presented the notion that these fishers have seen recovered swordfish (*X. gladius*) and albacore tuna (*T. alalunga*) populations with increased individual sizes. However, local markets undervalue these species due to a lack of recognition of the product quality. Furthermore, species with relatively high commercial value in other markets, such as squid (*O. bartrami*) and dolphinfish (*C. hippurus*), can hold negligible commercial value in local Italian areas (Battaglia et al., 2017). This also suggests the increased value of exported catch if the wholesale market allows it. The power of existing Italian market structures is also exemplified in the administrative region of Calabria (Palladino et al., 2019). In Palmi, the catch is directly sold to local vendors through informal agreements. Gioia Taura has a wholesale market where local fishers sell half their catches and half directly to consumers. Cannitello depends on neighboring SSF fleets to fulfill market requirements, as only two SSF vessels are registered there. Thus, local market dynamics and community interconnection significantly shape SSF economies (Palladino et al., 2019).

Market impedes Facilitation of Contextualized Regulations.

Experts **(1, 4, 12, 13, 14, 16)** also deemed Italian SSF markets as impeding the facilitation of contextualized regulations. Expert 14 mentioned that the lack of official markets makes tracking information surrounding market activities difficult. As he noted, a considerable part of the sales is managed by families that sell products to people they know at different selling points. This lack of traceability is not uniquely Italian and follows a broader Mediterranean challenge (Penca et al., 2021). The region's limited access to this data results from the organization of value chains and market structures. These markets generally lack product traceability, leading to the mixing of SSF products with LSF products, aquaculture products, imported products, and even recreational and illegal fishing products. In turn, it also hinders recognition of SSF product quality, such as the local production freshness, culinary varied nature, and seasonality (Penca et al., 2021). Naturally, the lack of traceability and different destinations (retail, wholesale, markets, fishmongers, restaurants, etc.) also hinder data collection by actors in the multi-level information system (Battaglia et al., 2017). Indeed, this is also addressed through the more authoritative approach set out in the approved Regulation (EU) 2023/2842 (2023), as it explicitly necessitates the enhancement of the traceability of SSF products. Still, considering the current state of traceability in the Italian SSF market, this approach will require considerable effort. Furthermore, with the lack of bargaining power of Italian SSFs, it is unclear if this additional traceability will favor them or if the additional administrative burden will primarily fall upon them, resulting in additional challenges.

The Value of Community Services and Economic Alternatives

Four experts **(2, 10, 12, 16)** also suggested that community services of Italian SSFs reflect a socio-ecological value, which is more recognizable in efforts to facilitate the contextualization of regulations. Expert 12 considered community services to activities such as fishing for litter or collaborations with research institutes **(12)**. As Raicevich, Grati, et al. (2020) also suggested, SSFs can indirectly positively affect other sectors, such as the tourism industry. This is exemplified by the non-productivist adaptation strategy of the recreational activity of "pesca-tourism" that some Italian SSFs adopted, with which tourists are transported on SSF vessels. Fishers from the Tuscan FLAG utilized this activity for extra income, especially when faced with challenging market situations (Prosperi et al., 2019). Expert 13 also reflected on an example from Conil in the south of Spain, which she perceives as the ideal situation in Italy. This would represent a local community where fishers have

demonstrated commitment to sustainability, agreeing to expand or create a Marine Protected Area (MPA), implement a VMS on board to collect their own data, use it to manage the MPA, establish a marketing process with traceable seafood, and develop a tourism network of hostels managed by relatives of the fishers. The system would also present tourists with the value of local SSF communities **(13)**. Still, Expert 1 expressed more skepticism and noted that the utilization of economic alternatives is not viable for all Italian SSF operators, as they are fishers first. Instead, it was emphasized that a solution should be found at sea. He also suggested that when experimented with and consolidated, the concept will reveal that no fishers can or want to engage with tourists due to availability and capacity limitations. This indicates that community services might only favor the contextualization of local regulations when those services meet the interest of local Italian SSFs. As such, promoting community services on a broader scale will likely be considerably challenging in facilitating contextualized regulations of more Italian SSFs.

Market impedes Facilitation of Co-management

It was also suggested by experts **(1, 12, 13, 14, 16)** that the market can impede the facilitation of co-management of Italian SSFs. For instance, Expert 14 addressed that market monopolies can also affect local governance decisions. Indeed, Penca et al. (2021) also suggested that efforts to improve SSF sustainability are hindered by markets contingent on existing organizational structures and marketing systems that follow separate policies from those of the CEG system. Thus, these long-standing market systems often impeded the introduction of novel regulations due to lock-in effects and path dependencies of related institutions (Penca et al., 2021). Indeed, this seems to support experts' suggestions concerning the impediment to co-management schemes. Considering the literature (Calò et al., 2022; Penca et al., 2021; Prosperi et al., 2019), it also seems unlikely that Italian SSFs would ignore these market policies in their ambitions to facilitate co-management due to their high dependence on current market structures. Comparatively, Catalonian (Spanish) fisheries targeting sandeel (*G. semisquamatus*) were suggested by Expert 13 to have more control over market structures, allowing them to facilitate co-management. Furthermore, she noted that a more direct relation with the final consumer in the value chain also allowed for more market power and capacity to participate in co-management. Indeed, Prosperi et al. (2019) also suggested that Italian SSFs must explore alternative market revenues by selling directly to local consumers. Alternatively, they noted that SSFs can also sell to purchasing groups to produce products of higher quality, also allowing them to meet the demands of processors better. Still, wholesalers hold the power surrounding the sale of these products (Prosperi et al., 2019). Thus, while value-added products might provide support, it seems like the direct sale to local consumers will likely favor the market position most and, in turn, facilitate co-management. Still, Expert 13 also emphasized the impeding factor for co-management that SSF competition with other fishing fleets in the market has.

5.2.2 Competition with Other Fishing Industries

Competition between Small-scale and Industrial Fisheries

Most interviewed experts addressed the general aspect of competition between Italian SSFs and LSFs and associated power imbalances as direct and indirect impediments to the recognition of Italian SSFs **(1, 2, 3, 4, 8, 9, 10, 11, 13, 14, 16)**. Raicevich, Grati, et al. (2020) also considered conflicts with LSFs as one of the critical threats to SSFs, as they target similar species and compete for fishing grounds. As a result, the LSFs can deplete shared exploited marine resources, on which SSFs are more socio-economically dependent. Furthermore, it has been found that SSFs often complain about trawling vessels destroying static LSF gears, especially in areas where trawling is not even permitted (Raicevich, Grati, et al., 2020). The paper of Grati et al. (2022) showed that spatial information on Southern Sicilian SSFs is not as abundant as the Automatic Identification System (AIS; allowing for the electronic tracking of vessel activities) data of LSFs. This situation resulted in unmonitored spatial

conflicts between SSFs and LSFs, of which the latter were likely driven into the targeted coastal areas of SSFs, as trawling was prohibited outside these coastal areas. According to Grati et al. (2022), such competition for space and the oversight of historically socio-economic important SSF fishing grounds could best be solved through more inclusive and transparent interactions with SSFs in spatial management processes.

Expert 8 also suggested that the socio-economic sustainability of both SSFs and LSFs is not sufficiently considered in regulations. Expert 4 noted that economic data of Italian SSFs is collected at the same level as LSFs and that the STECF's Annual Economic Report (AER) on the EU fishing fleet presents information on the economic performance of both industries **(4)**. Given these conflicting attitudes, questions could be raised about how credible the socio-economic data of Italian SSFs is perceived by actors, whether aggregating all data on a national level impedes the ability to contextualize sub-national and local circumstances in international and national governance processes, and whether data is effectively utilized in the assessment and advisory processes to ensure contextualization of regulations.

Competition between Small-scale and Recreational Fisheries

Italian SSFs also share a widespread challenge in competing with recreational fishers who receive poor enforcement of catch limits. This challenge is evident in the estimation of the number of Italian recreational fishers, with 538.000 fishing by boat and 235.000 engaging in free diving or beach and quay fishing (Raicevich, Grati, et al., 2020). Furthermore, along the north-western Adriatic Sea, landings of recreational fishers may equal between 30% and 45% of the landings of SSFs in this area (Raicevich, Grati, et al., 2020). Three experts **(4, 10, 13)** also reflected on this threat. It was noted that this concerns competition for shared resources and spatial conflicts, as both activities take place near the coast where the space for fishing is limited. Furthermore, SSFs use set gear that sometimes stays at sea for multiple days, so space is a limitation factor for them **(4)**. Catch of recreational fishers can also overlap with SSF target species, and cases show they have been sold illegally. In Milazzo (Sicily), SSF operators noted that recreational fishing is often synonymous with illegal fishing, and many practicing illegal fishing are hiding behind the definition of "recreational fisher". As a result, the local SSF called for increased control measures that focused more on illegal fishing practices (Battaglia et al., 2017). This resulted in more restrictive imposed legislative measures that received a higher level of acceptance as they were shared with all local (professional and unprofessional) fishers, following a broader LMP containing desired co-management actions (Battaglia et al., 2017). According to Battaglia et al. (2017), the socio-economic viability of fishing alongside marine protection was previously ineffective in Milazzo. It could only be resolved by sufficient collaboration between institutions and managers intending to harmonize fisheries' governance with MPA regulations while recognizing the cultural importance of the SSF in Milazzo. This shows that effective co-management can aid in competitive conflicts and suggests that Italian SSFs are more likely to adhere to regulations with adequate contextualization.

The lack of quantification of recreational fishing activities and their right to fish without an obligation to report the catches was also considered a key concern, as this would lead to misrepresentation **(13)**. Thus, it was suggested that the recreational industry must also organize and contribute to data collection processes to improve the legitimacy of Italian fisheries resources management **(13)**. Battaglia et al. (2017) also addressed the need for more recreational data relating to the targeted resources, utilized gears, fishing locations, and seasonal patterns. As they suggested, this data is crucial for comprehending the interactions between recreational fishers and SSFs. It was also noted that this should be considered as one of the main concerns in Mediterranean SSF governance **(10)**. Indeed, Regulation (EU) 2023/2842 (2023) will also mandate catch recording and reporting of "some

recreational fisheries". While it is still unclear what this will look like, it does suggest that Italian SSFs could indirectly benefit from this additional level of data quality and quantity through more contextualized regulations that recognize these competitive threats.

Competition for Space

Increased urbanization also causes coastal habitat degradation and ecosystem pollution on which the productivity of Italian SSFs depends. Generally, competition for space threatens SSFs' prospects following increasing maritime traffic, gas and oil extraction, wind farms, nautical tourism, and aquaculture (Raicevich, Grati, et al., 2020). This all emphasizes the need for contextualized Marine Spatial Planning (MSP) regulations to mitigate the challenging competition for space that threatens Italian SSFs. However, this will likely require a considerable quantity of data of considerable quality, which is not always present, as discussed in *Section 6.1.2*.

5.2.3 Insufficient Generational Turnover

Naturally, the threats addressed in the previous sections consider how Italian SSFs experience these issues. However, seven experts **(1, 2, 8, 9, 10, 13, 14)** also addressed that the Italian SSFs also face an uncertain future due to the lack of generational turnover in the Italian SSF industry.

The Motivation of Future Generations

The challenge was addressed that fishers do not want their kids to become fishers due to the challenging living conditions and ineffective recognition of impossible adherence to governance **(13)**. Although no specification was provided for measures that could not be adhered to, this does suggest that aspects of the currently applied form of CEG impede new generations from following current generations in their line of work. Indeed, Expert 8 also noted that most fishers have lost hope that there will be a future generation and that without increased generational turnover, the future of the SSF industry is considerably insecure. Literature also reflects on the challenge of insufficient Mediterranean (Márquez Escamilla et al., 2022), Southern Italian (Nicolosi et al., 2021), and more local (Casagrande et al., 2021) Italian generational turnover, confirming this expert-identified existential threat to Italian SSFs.

Experts **(8, 9, 10, 12, 16)** also addressed that the new generation must be motivated to enter the Italian SSF industry. According to Expert 9, data does show that while the fishing population is aging quite rapidly, it is aging more slowly in the SSFs, which was deemed to be due to more interest of future generations as it is more likely to concern a more family-run business. The importance of recognizing the participation of fishing families in the facilitation of co-management was also suggested by Casagrande et al. (2021). Notably, Nicolosi et al. (2021) also suggested that co-management would be essential to approach the challenge of a lack of generational turnover, especially by developing entrepreneurial initiatives that ensure socio-ecological sustainability. This was also noted by Casagrande et al. (2021), with the conviction that co-management would allow the facilitation of institutional innovations that can enhance SSFs' capacities for responding to crises. As such, co-management could be an effective tool to increase the hope of Italian SSFs for the future and motivate future generations to take over the tasks of preceding generations.

The Recognition of the Role of Immigrants

Notably, Expert 14 also suggested that African immigrants now operate a considerable part of SSFs. The role of immigrants in Mediterranean SSF governance was also addressed by Márquez Escamilla et al. (2022), emphasizing a lack of statistical data that limits their recognition. As such, questions can be raised about the extent to which the contextualization of regulations could be impeded in efforts to recognize the socio-economic values and role of immigrants.

Embracing Diversity in the Italian SSF Industry

Expert 10 also noted that women must be motivated to join the industry. He reflected on cases in Andalusia, where there are women skippers, and that no distinction should be made based on gender. Furthermore, he emphasized that the SSF industry was perceived as a man's world but that this notion is changing and that there is a need to embrace diversity in the fishing industry. Indeed, examples of local SSFs communities dominated by women can also be found in Italy, like in the Po Delta Biosphere Reserve in northeastern Italy (Stefania D'Ignoti, 2021). Still, Expert 9 also emphasized that women are considerably underrepresented in data regarding their presence and importance. This, along with the situation of the immigrants in Italian SSF governance, suggests that while there might be new hands to pick up the work threatened by the current lack of generational turnover, the recognition of their value and consideration of their livelihoods in regulations may also impact the motivation that young generations have already experienced.

5.3 Cases of Regulatory Challenges in the Face of Ineffective Recognition

As presented in the previous sections, Italian SSFs face common challenges, yet sub-national variations exist in specialization, productivity, and profitability. Recognizing these differences is important because they emphasize the challenge of coming to all-encompassing multi-level governance and the definition of shared characteristics. It is beyond the scope of the thesis to discuss all sub-national or local challenges. *Cases 1 to 4* discuss sub-national and local differences, which indicate how the information system experiences challenges in effectively recognizing the socio-ecological characteristics of Italian SSFs. These cases also exemplify failed recognition of SSF characteristics, resulting in ineffective governance. Such examples are also provided in *Cases 5 and 6,* in the form of general failed governance recognition of Italian SSF gear characteristics and surrounding socio-economic importance, without focus on sub-national and local differences.

Case 1: Sub-national Differences in Octopus' Regulations

There are no national Italian management measures for octopus fisheries, while this species is subjected to the European Mediterranean Regulation with measures on allowed minimum mesh sizes and exploited areas (Pita et al., 2021). The traditional consumption of cephalopods in Italy has resulted in a market that is among the most important cephalopod markets worldwide. Italy does not have one fishing fleet dedicated to exclusively catching octopus species (O. vulgaris, E. cirrhosa, and *E. moschata*) (Pita et al., 2021). Rather, fragmented local SSF fleets account for a large portion of all Italian landings and are of considerable socio-economic importance when regarding the provision of employment and income in local communities (Pita et al., 2021). Italian SSFs caught 55% of Italy's 3800 tonnes of total landed octopuses in 2019. Of this total, about 1186 tonnes came from Sardinia, and about 70% of the landed catch in Sardina came from SSFs, which are subjected to input (gear limitations and limitations of fisheries licenses, etc.) and output controls (Pita et al., 2021). Most notably, the Sardinian output control on minimum landing weights (MMWs) per specimen of the Common octopus (*O. vulgaris*) of 300g is considerably smaller than the MMW in most Spanish regions (1000g) (Pita et al., 2021). Indeed, it also indicates that while Italian SSFs are governed by the same international framework as other Mediterranean SSFs, national and sub-national governance (and associated resulting challenges) can vary considerably.

This also follows from the fact that Sardinia is the only Italian region that enforces these MMWs (among other unique control measures). Even though such sub-national governance seems to go against conservation objectives counterintuitively, the biological behavior of these species in Sardinian waters suggests that female individuals reach maturity between 410g and 2830g (between 195g and 3522g for males). Size at spawning was found to be between 730g and 1684g for females (Cuccu et al., 2013). Conservatively, when only considering the preceding maturity stage of females,

this would mean that the average female specimen caught in Sardinian waters is unlikely to have a chance to spawn eggs. Following basic principles of fisheries ecology and examples from a fisheries governance case in Senegal (Thiaw et al., 2011), where octopus specimens were caught in a similar unsustainable fashion, such practices could potentially reduce the spawning stock biomass, reduce the chance for recruitment success and provide a risk to the total stock biomass being overexploited. Nonetheless, there is an absent CFP requirement to assess Italian cephalopod stocks or regulate cephalopod catches (Pita et al., 2021). This absence of a shared international scientific basis and imposed regulations might also impede sub-national efforts to meet best governance practices that focus on conservation objectives and national equity among SSF regulations.

Still, the research results of Cuccu et al. (2013) were also discussed in a workshop of the International Council for the Exploration of the Sea (ICES) in 2010. These discussions resulted in a voiced necessity by ICES to adopt improved scales of maturity in assessment models that are used for the formulation of control measures. Indeed, ICES is part of the information system in the governance of Italian SSFs (see *Section 6.1.1*) (Cuccu et al., 2013; Said et al., 2020). This indicates that even when the information system calls for certain regulations to be more contextualized and reflect scientific principles of fisheries ecology, the CEG system does not always follow this up with the necessary adjustments of sub-national regulations.

Case 2: Challenges Resulting from International Regulations on Pelagic Species

Unlike most Italian SSFs, Aeolian SSFs show a primary socio-economic dependence on pelagic species (*T. alalunga, X. gladius, T. thynnus*, and *T. sagittatus*) (Battaglia et al., 2010). These species are relatively more abundant here than in other Italian regions, and the SSFs evolutionary conditioned themselves to catch these species. The higher interaction rate with tuna species also means that Aeolian SSFs are subjected to ICCAT regulations surrounding bluefin tuna (*T. thynnus*) (Battaglia et al., 2010). As a result, they are challenged with accidental catches, as they do not have quotas to catch them. Still, due to the enforcement of the LO, they must land all caught specimens in the nearest harbor and are penalized if they exceed an annual limit of allowed bycatch (Battaglia et al., 2010).

SSF characteristics can vary greatly between nearby local areas (Palladino et al., 2019). In Palmi (the southernmost trait of the Tyrrhenian coast of the province of Reggio Calabria), a nocturnal fishing practice based on surrounding nets or traditional longline techniques is emphasized. While in Scilla, a fishing port approximately 25 km removed from Palmi, fishers practice traditional swordfish hunting with a “passerella” (see *Figure 4*). Only two of the numerous vessels that were active a decade ago remain. Back then, the activity was a season-long dedication for entire families near Scilla (Palladino et al., 2019). Indeed, much of this activity aligns with the definition of the FAO Fisheries Glossary, as it concerns one with a solid social and cultural local identity involving fishing households and always having been mainly intended for local consumption (Grati et al., 2022; Palladino et al., 2019). This is likely also why Palladino et al. (2019) have presented it as an SSF in their paper. Furthermore, the harpoon is relatively selective, and

Figure 4: A "passerella", shown with a typical "antenna" of between 15-25 m tall where a spotter stands. Once a swordfish is spotted, a harpooner will stand at the end of the ≈30-meter-long bridge that is mounted at the bow of the vessel, to strike the shot (Daniele Riefolo, 2023; Palladino et al., 2019).

seven experts **(2, 4, 9, 10, 11, 13, 14)** also considered a low ecological impact as a defining characteristic of Italian SSFs. However, considering the size of the "antenna" and bridge on the passerella exceeding 12m, it would not fit the definition of the EMFAF. Hence, these fisheries do not have a right to appeal to the same (and larger) subsidies available for Italian SSFs, as these are only granted to vessels smaller than 12m (European Commission, 2021). These subsidies could have aided them in combating the high operating costs associated with this technique and becoming profitable again (Palladino et al., 2019). Palladino et al. (2019) also proposed that these fishers should receive more promotion due to their lesser ecological impact. According to them, more contextualized regulation could aid these fisheries, for instance, in the form of a small share of the bluefin tuna quota.

Still, facilitating this might be challenging, as the ICCAT has recommended the EU to allocate no more than 2% of bluefin tuna quota among SSF vessels in the Mediterranean (ICCAT Recommendation 19-04, 2019). Furthermore, as LIFE (2020) suggests, European bluefin tuna quota negotiations generally favor the LSF industry. Spagnolo (2010) also suggests that the allocation of quotas and technical measures of the ICCAT are mainly based on biological priority, while Italian state authorities must implement management decisions that consider the industry's socio-economic dimensions. The resulting challenges of the imposed quotas not fitting local circumstances have also been suggested as one of the reasons for IUU practices, as SSFs are encouraged to misreport catches (Spagnolo, 2010). Prosperi, et al. (2019) also described cases of Italian SSFs avoiding enforced quota by directly selling catch to restaurants, outside of governance control. As they put it, the resulting detrimental impacts on ecosystems and biodiversity, and facilitated competition are also an indirect effect of international regulations not fitting local circumstances.

Still, the EU Multi-annual management plan for Bluefin Tuna A9-0149/2020 (2021) demands that each Member State to endeavor allocating sectorial quota for SSF vessels, to include this allocation in the fishing plans, with additional measures to closely monitor the quota consumption by SSFs in the monitoring, control and inspection plans. They also considered SSFs with a narrower definition than the EMFAF, by having them meet at least three of the next particularities: 1) the total length is less than 12m; 2) the vessel exclusively operates within the waters of the flag Member State; 3) fishing trips last for less than 24 hours; 4) maximum crew size is limited to four individuals; 5) the vessel employs selective techniques with a minimized environmental impact. Furthermore, this multi-annual management plan addresses the need to account for the specific characteristics and needs of SSFs, and to remove obstacles to the participation of SSFs in targeting bluefin tuna. The notion that Italian SSFs experience sub-national challenges in quota allocation might also indicate that the failed recognition of SSFs in bluefin tuna quota discussions is partly due to the translation from EU regulations to adhering to national, sub-national, and local measures. Notably, the ICCAT can also provide binding recommendations on the number of fishing vessels allowed to catch species such as bluefin tuna. In 2020, no Italian SSF vessel was allowed to fish for, retain on board, transship, transport, or land this species (Council Regulation (EU) 2020/123, 2020). This raises the question of how national and local circumstances were considered, especially with the relatively high abundance of this species in areas like the Aeolian Islands. Furthermore, GFCM member states such as Spain, France, Malta, and Greece received authorization to allow SSFs to catch these species (Council Regulation (EU) 2020/123, 2020). Again, this exemplifies national and sub-national differences in the governance that Mediterranean SSFs experience.

Case 3: MPA Interactions with Italian SSFs

Italian MPA governance is traditionally centralized, associated with weak enforcement, and lacks financial and staff capacity (Di Franco et al., 2020). Multiple case studies also presented hindered effectiveness of MPAs by deficient governance, with limited stakeholder participation, insufficient

communication, a lack of transparency, and inadequate management procedures (Di Franco et al., 2020). MPA governance in different areas also ranged from governance where decision-makers and SSFs proactively expressed their views on proposed decisions to SSFs only being unilaterally informed on management decisions (Di Franco et al., 2020). Battaglia et al. (2010) also confirmed that assigning an MPA in the Aeolian Islands could address the need for improved conservation of the environment and exploited resources while integrating cultural traditions and fishery governance (with careful monitoring, evaluation, and planning). This arguably indicates local challenges in ensuring associated regulations are correctly contextualized. Still, it might also suggest that co-management of Italian SSFs could aid the lack of state capacity for enforcement.

SSFs catch more threatened and data-deficient elasmobranch species in partially protected areas than in unprotected areas, directly resulting from poor SSF governance inside MPA areas (Di Lorenzo et al., 2022). Indeed, this indicates that enhanced recognition and participation of Italian SSFs in governance could also serve the conservation objectives of state authorities. The associated data quantity and quality would also allow for enhanced recognition of necessary measures to protect Endangered, Threatened, and Protected (ETP) species.

Case 4: Challenging Regulations on Cetacean Conservation

Geraci et al. (2019) suggested that international regulations that mitigate fisher interactions with cetaceans, sea turtles, and seabirds might impact Italian SSFs most, while sub-national differences are present. For instance, Italian SSFs in Friuli, Campania, Sardinia, and the Apulia regions have been observed to experience more of a relative socio-economic impact due to interactions with ETP species (Geraci et al., 2019). This causes economic challenges like net damage, reduced catch value, and diminished catch volumes. Nonetheless, Italy's commitments to international legislative instruments, such as the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea, and Contiguous Atlantic Area (ACCOBAMS), have been suggested to result in a challenging balance between meeting commitments to protect dolphin populations and the socio-economic necessities of fisheries (Authier et al., 2017; Geraci et al., 2019). These species are also protected by law, demanding SSFs take measures to reduce the likelihood. As a result, SSFs experience this negative economic impact more than LSFs. It seems likely that this duality of consequences also adds to the relatively high rate of disagreements between control authorities and SSFs (Authier et al., 2017; Geraci et al., 2019). Similar challenges were also experienced in Eastern Sicily, where SSFs consider the control activities inconsistent and based on a lack of information on the local situations (Monaco et al., 2019). Thus, building on the argument in *Case 3*, while better recognition and participation of Italian SSFs in governance could favor enhancing measures toward the protection of ETP species, it is also essential to ensure regulations are sufficiently contextualized regarding the recognition of the effects of these measures on livelihoods that depend of SSFs.

Case 5: Challenging Categorization of Fishing Gears and Techniques

The application of a specific passive gear (e.g., a trammel net) can show differences, too (e.g., in the combination of mesh sizes, exploited fishing grounds, fishing time and season, targeted species, etc.) (Falsone et al., 2020). Such combinations can be defined as one activity commonly referred to in Mediterranean SSF governance as a "métier" (Ulrich et al., 2012). As suggested by (Ulrich et al., 2012), the fleet segment definitions in the EU's DCF do not account for the management complexity, scientific uncertainty, and political sensitivities surrounding local métiers. Likewise, they argued that this rigid categorization fails to fit the flexibility of all individual SSF activities.

It has also been found that selectivity and ecological impacts of different métiers of the same gear can have different ecological impacts, even within the same exploited area, in general, and in Sicily

specifically (Cambiè et al., 2020; Falsone et al., 2020). For instance, in Sicily, multiple métiers were defined based on combinations between factors such as applied gear, soaking time of nets, and primary and secondary species, with each combination causing different impacts on ETP species. This impedes adequate bycatch estimations and comparisons based on the generally applied fishing gears and might also limit the effectiveness of conservation measures implemented on a broader scale based on local situations with certain métiers. Furthermore, SSFs often switch between applied métiers (Cambiè et al., 2020). This also impedes managers in detecting the utilization of an illegitimate métier that goes against conservation measures. Likewise, it has been found that measures implemented to meet conservation objectives for one species have resulted in shifts of applied métiers that caused unforeseen impacts on other fragile species (Cambiè et al., 2020). These challenging situations also resulted in calls for LMPs to be better equipped to identify local métiers and implement effective conservation measures (Cambiè et al., 2020).

As follows from González-Álvarez et al. (2016), the identification of métiers is often based on large sets of historical data reflecting species composition or catch data. They deem that this is especially problematic in the case of the often data-limited SSFs. Falsone et al. (2020) suggest that this is also one of the biggest challenges in Sicilian SSF governance, leading to a lack of knowledge of the landing profile and main fishing métiers. This lack of data, paired with a high diversity of landed species and different fishing métiers, has provided a complex governance situation (Falsone et al., 2020), which likely limits the contextualization of multi-level regulations.

Case 6: Socio-ecological Impact of Prohibiting Driftnets

Another example of the negative socio-ecological impact of seemingly ineffective contextualization of regulations follows from the literature on the "spadara" driftnet ban. As per EC Reg. 1239/98, Italian SSFs pursued ongoing transformations to adjust to this ban, resulting in more versatile and seasonal fishing activities (Battaglia et al., 2010). Furthermore, despite receiving economic incentives to cease or alter their operations (1999/27CE), certain fishers that previously utilized the “spadara” technique opted to continue fishing with different techniques, investing in the construction of larger vessels for a new driftnet fleet employing "ferrettara”. Other fishers shifted their focus to coastal areas, altering their fishing activities and target species. Consequently, the ban resulted in fleet modernization, a transition from pelagic to coastal administrative regions, and heightened competition among coastal SSFs. According to Spagnolo (2010), this competition often was associated with already overexploited populations. Hence, fishers attributed a significant and gradual decrease in trammel net catches over the past two decades to the driftnet ban. Still, factors such as pollution and increased human activities could also have had an effect. The resulting challenges have had significant socio-economic impacts in some Italian villages, such as Milazzo, which has historically depended on the “spadara” driftnets (Battaglia et al., 2010).

Calabrian SSFs also continued to employ banned driftnets, as they felt deprived of income by only being allowed to target swordfish with more expensive fishing techniques (Battaglia et al., 2017). Furthermore, they suggested that this had adverse ecological impacts, as other commercial species were more abundant when the technique was still legal. Fishers reasoned that this resulted from more target pressure on certain species (Battaglia et al., 2017). Currently, fishers apply alternative techniques that could potentially lead to overexploitation of some whitefish stocks. The research of Battaglia et al. (2017) also showed that fishers in this administrative region do not feel supported by state authorities. According to them, the lack of involvement in governance processes led to an unnecessary ban. Still, they could provide crucial insights for shaping more effective regulations that prevent unforeseen consequences like the reduced diversity of other commercial species, which were not reported in previous legal and public debates (Battaglia et al., 2017).

According to Spagnolo (2010), the driftnet ban provides a clear example of inefficient multi-level governance processes due to multiple institutions participating with differing interests. This inefficiency also resulted in the buy-out of a large number of fishers who were already approaching the age of retirement. Indicative of the ineffective multi-level governance processes is that the driftnet ban has been imposed due to political and diplomatic pressures that boosted the importance of adhering to certain United Nations (UN) resolutions (Spagnolo, 2010). Spagnolo (2010) also suggested that DG MARE based the necessity of the ban on a precautionary approach principle without being supported by data that concerned incidences of bycatch of marine mammals and seemingly disregarded studies that demonstrated the ineffective application of the measure. Consequently, the Italian state had to minimize the socio-economic damages that imposed international regulations would cause as much as possible (Spagnolo, 2010).

5.4 Conclusive Remarks on Characteristics and Challenges of Italian SSFs

Italian SSFs present a multitude of socio-ecological characteristics. They generally operate near the coast, mainly utilizing low-power engines and passive gears. Individual fishers or small families operate most vessels. Their fishing practices are integral to local coastal communities' cultural and ethnographic values. Market dynamics, including their lack of market power, are broadly shared characteristics that threaten their existence and drive unsustainable fishing practices. These market challenges also impede efforts to facilitate contextualized regulations and co-management due to the lack of traceability of products and market policies, which Italian SSFs cannot easily ignore. Furthermore, Italian SSFs have to operate in a highly competitive landscape with LSFs and recreational fisheries, which are considered to provide direct threats to their existence. These threats are extra problematic, as the generational turnover is deemed to be considerably low and likely will impede the motivation of others to take over the work that the current generations will be leaving.

Part of their characteristic is also related to their historical neglect and marginalization compared to other fishing industries. Despite their socio-economic importance and challenges, they have often been overlooked in governance processes. The decentralized approach of the GFCM and guidelines in the GFCM 2030 Strategy and RPOA-SSF show improvement, but challenges resulting from ineffective governance have been observed with sub-national variations. This chapter exemplified challenges by addressing sub-national differences in octopus regulation, challenges resulting from international regulations on pelagic species, MPA interactions with Italian small-scale fisheries, and challenging regulations on the conservation of cetaceans. While these cases provided clear examples of how sub-national differences have insufficiently been considered by governance, it is expected that more of these challenges can be found. Likewise, cases of the socio-ecological impact of prohibiting driftnets and the challenging categorization of fishing gears and techniques also indicated how sub-national and local differences can create challenging situations in the contextualization of regulations. Indeed, it seems likely that Italian SSF characteristics are often assumed but not broadly confirmed in governance processes, driving some of their existential threats. It seems likely that this impaired recognition might also impede efforts to make effective distinctions between what are legitimate and illegitimate practices, resulting in unnecessary criminalization of Italian SSFs. On the other hand, it also indicates why fishers might feel justified in ignoring adherence to regulations that they deem inconsiderate of the local circumstances.

In conclusion, Italian SSFs face various identified socio-ecological challenges compounded by ineffective governance processes. This also already suggests the ineffectiveness of the state-led information system, discussed in *Chapter 6*, that precedes these governance processes. Reform of this system is necessary to enhance the recognition of the diverse characteristics and needs of Italian SSFs and allow for more contextualized regulations and co-management approaches.

6. Recognizing Italian SSFs through Conventional Governance

This chapter discusses the multi-level information system, which responds to the pulling mechanisms of the policy actors and instruments described in *Chapter 4*. It delves into the current information flows and hints at their effectiveness in facilitating contextualized regulations and co-management of Italian SSFs. It provides a baseline recognition of the necessary efforts to enhance these flows. Furthermore, it considers how these state-led information flows can constrain the facilitation of contextualized regulations and co-management of Italian SSFs through expert-identified informational challenges expected in enhancement efforts. This facilitated the comparison of the effects of the informational challenges identified, discussed in *Chapters 7 and 8* in *Chapter 9*.

Italian SSF information undergoes a complex journey before it reaches the state authorities, as discussed in *Chapter 4* (Cardinale et al., 2021). This complexity aligns with the analysis of Burns (2011) regarding the EU multi-level information flows, who categorized international information flows into three groups: data collection, regional assessments and associated advice, and stakeholder involvement (see *Figure 5*). This chapter delves into the international information flows relevant to Italian SSF governance, along with informational challenges identified by experts in enhancing these flows. It also touches national, sub-national, and local information flows, primarily based on insights from interviewed experts in the form of identified informational challenges. For clarity, the chapter organizes all multi-level information flows and associated informational challenges in the same three groups outlined in *Figure 5*. It discusses processes and expected informational challenges in data collection (*Section 6.1*), assessment and advice (*Section 6.2*), and stakeholder involvement (*Section 6.3*). *Section 6.4* discusses the informational challenge of a general multi-level approach within the state-led information system. In contrast, *Section 6.5* presents expert perspectives on the current effectiveness of the system in contextualizing regulations and facilitating co-management of Italian SSFs. The chapter concludes by discussing this effectiveness and the impact of informational challenges on the reform of this system, with some remarks in *Section 6.6*.

6.1 Data Collection in the Multi-level Information System

6.1.1 Data Collection Processes

As an EU member state, Italy must comply with EU regulations regarding the collection of fishery data. In *Section 4.1*, it was explained that DG MARE provides a key role in framing fishery policy. Likewise, they provide a central role in the multi-level information system, as they perform a yearly call for data that must meet the EU's **Data Collection Framework (DCF)** (Wageningen University & Research, n.d.). The DCF obliges EU member states to collect, manage, and share a wide range of fisheries data in support of scientific advice (GFCM, 2018). This comprises biological, environmental, and socio-economic data. The EU also supports these activities financially (European Commission, n.d.-g). DG MARE also maintains the EU Fleet Register, which contains crucial characteristics of all EU vessels (European Commission, n.d.-f). For Italian SSFs, this concerns information on the number of vessels, days at sea, energy consumption, fishing days, number of fishing trips, number of nets and their length, number of hooks and lines, number of pots and traps, and the soaking time of fixed gears (Spagnolo, 2011). This is used to monitor the implementation of capacity management measures to meet the Common Fisheries Policy (CFP) requirements as the EU's key policy for fisheries management (see *Section 4.1*). It also aids control authorities in providing statistically accurate data on the European fishing fleet's particularities and development. Additionally, it serves as a database for defining vessel characteristics utilized in management measures, such as those of the EMFAF (European Commission, n.d.-f, 2021).

Section 6.1 will continue on page 40.

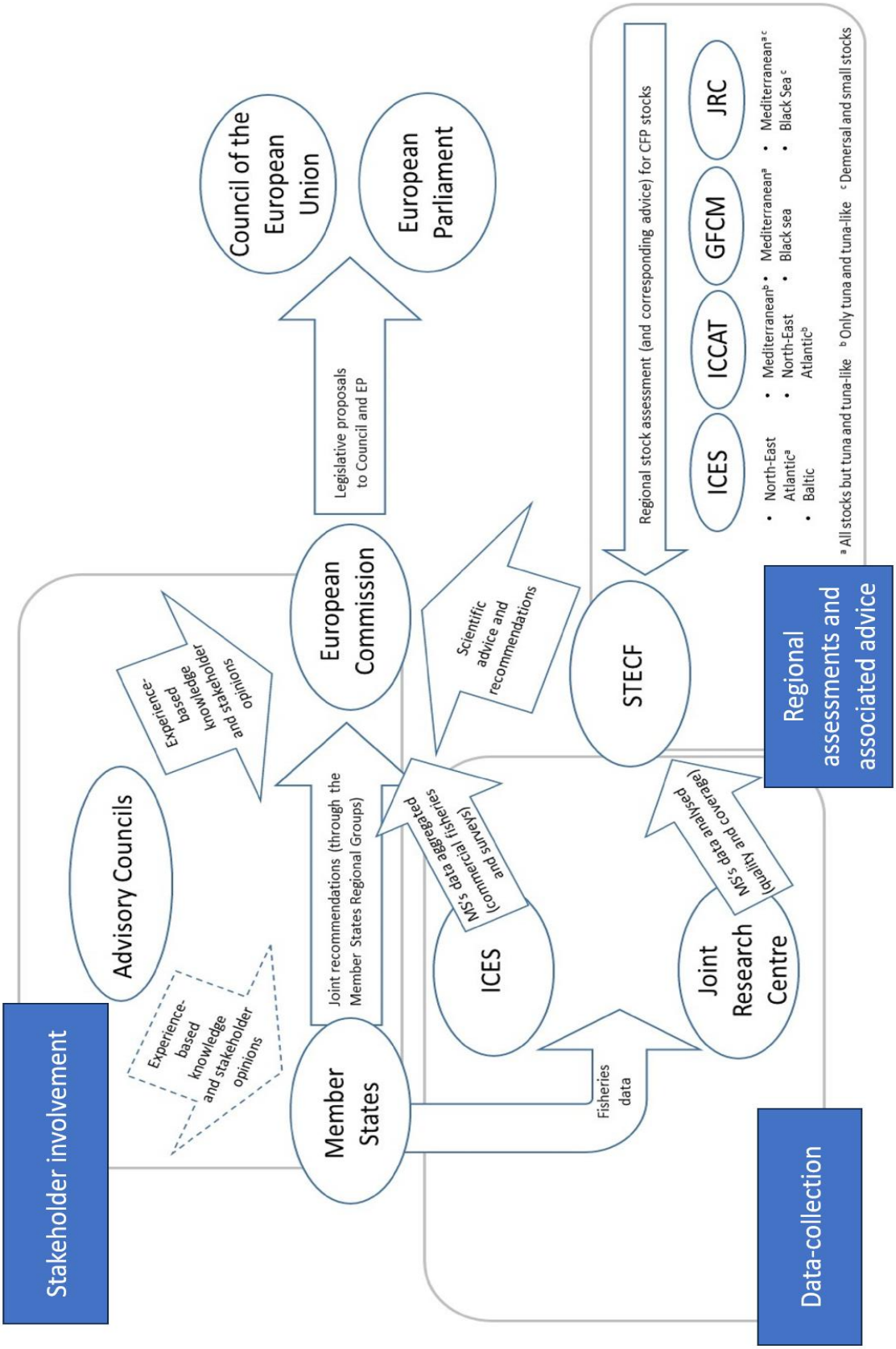

Figure 5: A visual representation of the state-led information system in Italian SSF governance, as created by Burns (2011). It presents the international information flows in three groups, relating to data collection, regional assessments and associated advice and stakeholder involvement.

In response to the DCF, Italy must gather and provide diverse fisheries data (Ramírez-Monsalve et al., 2021). The MiPAAF coordinates national research projects and data collection to meet EU requirements for stock assessments (MiPAAF, n.d.). They also hold accountability for the quality and thoroughness of both the primary data gathered by associated research institutions and the detailed and aggregated data forwarder to end users (Spagnolo, 2011). The traditional approach of biological sampling has focused on assessing stocks and resources within geographical areas (2011). Data collection regulations mandate sampling based on métiers for biological and catch data (including landings and bycatch) and effort data (Spagnolo, 2011). All data is requested in a hierarchical structure to define métiers in six levels: activity, gear class, gear group, gear type, target assemblage, and mesh sizes (Ulrich et al., 2012). All fisheries and fleet operations data are integrated with population information for commercially exploited stocks (Spagnolo, 2011).

Italy is also mandated to submit data annually or biennially, through the DCF, to the GFCM, including general figures on national fisheries, catch details, incidental catch of vulnerable species, fishing fleet and effort information, and socio-economic and biological data. Stakeholders can also share any data that falls outside the GFCM recommendations in the GFCM working groups (discussed further in *Section 6.2.1*). The GFCM also endorses the **MedSea4Fish** program, which integrates the CFP's principles of regionalization and stakeholder involvement (European Commission, 2022b). This program is guided by the GFCM 2030 Strategy, RPOA-SSF, and DCF and is based on a €8 million GFCM grant (European Commission, 2022b). With that, they support national technical capacity (i.e., related to data collection and research) (FAO, 2024e). This shows that informational pulling mechanisms from international modes of CEG are supported by an actor that attempts to aid the information system in meeting these demands.

At a national scale, most fundamental research is conducted by university laboratories and public institutes, such as the National Research Council – **CNR** (Consiglio Nazionale delle Richerche) (FAO, 2023). Many Italian research institutes are part of CNR, but CNR-IRBM (Institute for Biological Resources and Marine Biotechnologies) is the biggest regarding marine research (Grati, personal communication, 12 October 2023). **ISPRA** (Institute for Environmental Protection and Research) is also a public institute (FAO, 2023), which serves as the technical body supporting the Italian Ministry of Environment and performs research collaboratively with SSFs in efforts to consider their provision of socio-ecological solutions for various governance challenges (Raicevich, personal communication, 19 December 2023). Economic data and information on finance, operations, and marketing are gathered by **IREPA** (Institute for Economic Research in Fishery and Aquaculture/Istituto Richerche Economiche per la Pesca e l'Acquacoltura) (FAO, 2023). Private entities also carry out applied research under the coordination of the MiPAAF (FAO, 2023), of which no specific examples could be found in the literature. Still, this shows that the multi-level information system receives support from non-state actors, not necessarily indicating their support toward non-state IG principles.

The **Joint Research Centre (JRC)** analyses the data quality and coverage, aggregating information from commercial fisheries and surveys (Ramírez-Monsalve et al., 2021). They also validate and conduct statistical checks to ensure the accuracy and adherence of EU member states' data submissions to the prescribed formats of the DCF (Dörner et al., 2018). JRC's data, in turn, informs STECF, guiding DG MARE in preparing proposals on international fishing measures (Ramírez-Monsalve et al., 2021). The JRC also releases aggregated data in their reports to the public as electronic supplements (Dörner et al., 2018). **ICES** also aggregates data from Italian SSFs and surveys, which are shared with DG MARE for utilization in governance processes. However, ICES shares it directly with DG MARE, while JRC first shares it with STECF. Furthermore, while ICES performs assessments (and corresponding advice) for CFP stocks in the North-East Atlantic and the Baltic, it

does not perform such activities in the Mediterranean (this is done by other actors addressed in *Section 6.2.1*).

6.1.2 Data Collection Informational Challenges

Notably, even with this considerable list of actors involved in meeting the informational demands in CEG, most experts **(1, 2, 4, 5, 6, 8, 9, 10, 11, 13, 14, 15, 16)** shared informational challenges and their effects on the reform of the multi-level CEG information system to facilitate contextualization of regulations and co-management of Italian SSFs.

Lack of Socio-ecological Data Collection Processes

Of these challenges, most were related to convictions **(2, 5, 6, 9, 10, 11, 13, 16)** that data on Italian SSFs is relatively absent. According to Experts 13 and 16, this would be a direct result of the DCF's focus on LSF characteristics, which aligns with Raicevich, Grati, et al. (2020), who suggest that there is too little data on many Italian SSF target species due to the sole appliance of stock assessments on stocks targeted by LSFs. These concerns were also raised by Bousquet et al. (2022), who noted that without data on fishing effort, catch rates, and biological data (caught species, size structure, etc.), the integration of SSFs in national and international governance is a particular challenge. This provides an interesting notion, as the previous section addressed that the DCF and GFCM call for a wide range of data on Italian SSF characteristics. As follows from Song et al. (2020), SSF catches have generally not been included in stock assessments and governance methods, either due to weak state capacity for the enumeration of SSFs or because they deem these sufficiently robust for the SSF industry. However, they also note that underreporting of SSF activities is also what motivates criminalization. Given the underreporting of Italian SSFs, it might be that the ineffectiveness of the multi-level information system is currently motivating the relatively high level of IUU activities, too.

According to Expert 2, more integration of socio-economic studies is also needed, as there is especially little data of this kind. The inventoried number of SSFs shows little consistency between datasets, and an evaluation of socio-economic and fishing effort characteristics is ineffective before implementing regulations **(2, 5, 6)**. Furthermore, it was suggested that the collection of socio-economic SSF data is also minimal under the DCF **(10)**. This also followed the notion that the presence and importance of women in the SSF industry is also insufficiently represented in the data. Still, they are essential in fishing and along the associated value chains **(9)**. Indeed, the absence of socio-economic data in data collection processes has also been defined as hindering the balance between reaching conservation objectives and supporting fisher livelihoods in literature, as the CEG has seemingly committed itself to a path on which the supportive information system is lagging behind (Ramírez-Monsalve et al., 2021). Notably, the GFCM also expressed recognition of inaccurate, untimely, and incomplete socio-economic data on Mediterranean SSFs, resulting in their call for a comprehensive survey in their Mid-term strategy (2017-2020) (FAO, 2024d). In 2006, they also expressed interest in socio-economic data that reflects the age of crew members, number of years of active fishing for each crew member, capital ownership of each crew member, and educational attainment of each crew member (GFCM, 2006). Likewise, they expressed demand for macro-level data, such as import/export weight, vessel details, interest rates, working populations, and employment, to be categorized by GSA, operational port, and fleet grouping (GFCM, 2006). Still, no concrete GFCM datasets that present a seeming achievement of the GFCM regarding their previously formulated objectives could be found. This, paired with the lack of ecological data, raises the question of whether data collection processes are ineffective in meeting these international demands or whether this data is not effectively and transparently shared with other stakeholders.

To Oblige or Not to Oblige?

According to nine experts **(2, 4, 8, 9, 10, 11, 13, 14, 15)**, the amount of collected data is also the result of fewer data submission obligations for SSFs. It was noted that they are not obliged to collect their data in logbooks or use AIS systems, which limits assessing their status **(8)**. According to Expert 11, the lack of obligations surrounding VMS or AIS systems in SSFs can also create the perception that they do not exist in certain areas, which was considered both a local and a national challenge, as he noted that any map relating to the disturbance of the seabed and the general presence of fisheries are missing representation of thousands of fishing vessels. Three experts also said collecting data through logbooks is ineffective **(8, 11, 16)**. According to Expert 8, the valuation of SSF data coming from logbooks is also notably slower when compared to data coming from LSFs due to data sharing obligations that they have. Still, Expert 16 noted that data derived from logbooks of SSFs is the primary source of data, while it lacks quality and quantity. Expert 4 also suggested that most catches are not recorded in official documents and can only be found outside recognized markets. Di Cintio et al. (2022) show that landings and fishing techniques are not always declared, most SSFs are poorly monitored, and dedicated informational infrastructure is absent. Thus, this flexible approach toward data provision of Italian SSFs logically explains the lack of socio-ecological data.

Two experts **(10, 15)** also noted that quota allocation is based on historical data on catch efforts. However, as suggested by Expert 10, SSFs have never been obligated to report catch reports, limiting effective means to demonstrate that they have historically caught certain species. As a result, SSFs have advocated that the allocation of quotas is also based on other criteria, such as the biological impact and socio-economic importance **(10)**. Indeed, such criteria might also benefit quota allocation discussions surrounding pelagic species, as the ones mentioned in *Case 2 in Section 5.3*.

Considering this all, it followed logically that four experts **(11, 13, 14, 16)** considered the approved Regulation (EU) 2023/2842 (2023) as a positive development. As Expert 16 noted, the most positive aspect is that the GPS data will be required now, while a shorter implementation timeframe would have been preferred. This also aligns with formulated ambitions in Regulation (EU) 2023/2842 (2023), aiming to increase data quality and quantity. Still, while this increase in obligations was addressed as a positive development, Experts 5 and 6 also shared that this regulation would create additional daily struggles to meet administrative obligations.

In general, thirteen experts **(1, 2, 4, 5, 6, 8, 9, 10, 11, 13, 14, 15, 16)** also discussed that the level of interest or capacity of Italian SSFs to participate would directly impair the reform toward enhanced data collection processes. Voluntary data provision already shows low effectiveness, as receiving data on crew information such as age, nationality, and education levels is also limited based on questionnaires with low response rates (STECF, 2018). This might already indicate the effort a fisher is willing to put into ensuring effective data collection processes. Still, three experts **(5, 6, 9)** also suggested that improving the information system would demand more work from SSF operators. According to Expert 9, the amount of time fishers must dedicate to data provision can become a significant burden, which should also be considered a trade-off in the information system. Furthermore, Expert 14 suggested that they cannot be compared with LSFs, who are more likely to have leaders and coordinators to handle administrative procedures (e.g., funding proposals, contacting research centers, implementing action plans, etc.), allowing for easier monitoring. This raises the question of whether more obligations to allow for better contextualization of regulation do not also cause more challenges that should be considered in the contextualization of regulations.

The Challenge of Multi-specific Characteristics

Expert 10 noted that introducing specific local and more participatory sampling programs dedicated to SSFs should be pursued in reforming the information system, as it could provide precise and high-

resolution data. Part of this program would also necessitate that fishers are convinced of their participation by emphasizing improvements to their knowledge about their activities. Expert 11 shared this positive attitude toward a more nested data collection approach, as it could allow for a more advanced and detailed data collection process on a local scale and enhanced abstraction at a higher level in the information system. Three experts also mentioned that Italian SSFs should participate more in the data collection processes **(2, 10, 14)**. Still, more participation would also be impeded by the multi-specific characteristics of Italian SSFs **(4, 9, 10, 11, 14)**. Furthermore, he noted that the associated flexibility with the different métiers (seasonal activities, changing gear types every two or three weeks, changing fishing area, etc.) and the flexible timing of landing the catch makes it difficult to define when and how to collect data. The flexibility that the different métiers provide was also addressed as a challenge by Experts 10 and 11. This aligns with Calò et al. (2022) and Di Cintio et al. 2022), as they suggest that data collection has historically been impeded by the multi-specific nature and considerable socio-ecological heterogeneity of Italian SSFs, also impeding the integration of large-scale SSF monitoring programs. According to Expert 11, the current information system can also not statistically represent the value of the resilience that the flexibility of the métiers provides Italian SSFs. Still, the unpredictability also impedes data collection processes. Spagnolo (2011) also suggested that data collection regulations mandate sampling based on métiers, which is methodologically and statistically more complex than the standard and traditional LSF data collection approach (Spagnolo, 2011). Indeed, this indicates a considerable challenge for reforming the multi-level information system through CEG efforts, as it seems like the currently applied approach and the nature of Italian SSFs do not allow for effective data collection to facilitate contextualized regulations and co-management.

Still, it was also noted that ICES is actively pursuing efforts to standardize aggregation methodologies of data concerning gear types, target species, and the métiers on a multi-level scale **(10)**. Indeed, integrating the métier data into the DCF is also considered a challenging approach by Ulrich et al. (2012). According to them, the hierarchical definitions remain debated and hinder a standardized EU approach, resulting in national variations. They also noted that the approach is inherently challenging due to the subjective nature of categorizing fishing activities. SSF fleets and métiers are social entities and do not fit rigid definitions. As such, researchers and decision-makers use métiers as analytic units for governance efforts, but these are unlikely to represent the activities' dynamics fully. As Ulrich et al. (2012) suggested, there is a need for more European collaboration to formulate more effective unified methods for the scientific definition of the multi-specific nature of SSFs and also to reduce the costs of national sampling programs.

Multi-level transfer of data

However, this collaboration also seems quite unlikely when considering that not only the data aggregation but also the multi-level transfer of information is considered ineffective (Ramírez-Monsalve et al., 2021). Five experts **(2, 9, 10, 11, 13)** also addressed these multi-level differences as a challenge. For instance, it was noted that the GFCM has minimum standards for SSF data reporting on catch and efforts and socio-economic characteristics, while some of their Member States can sometimes struggle to meet those standards **(9)**. Furthermore, Grati & Perretta (2022) noted that data collection processes are not very specific on a national scale, as states are not obliged to share data grouped per sector. Expert 11 also suggested a challenge in ensuring that the data is shared with the appropriate governance level for statistical and management purposes. Expert 10 also suggested that institutes involved in the DCF are not always aware of the information collected through several multi-level projects. Spagnolo (2011) also identified challenges of multi-level misalignment in data collection processes, such as an excessive ambition of the CEG, insufficient emphasis on data utilization, incomplete DCF implementation, inefficient resource allocation,

complexity, a mismatch between needs and outputs (stratification métier Information), administrative burden, inadequate follow-up on MS actions, absence of a reporting website for reference material, underutilization of métier data by the GFCM, challenges in monitoring at-sea observations, concerns about data quality, lack of a catalog for Member States' recommendations, and a need for improved dialogue with data end users, emphasizing a shift toward results-based outcomes rather than merely data delivery in the DCF. This suggests that a considerable misalignment of multi-level data collection processes would impede the enhancement of data collection flows.

Ensuring Data Quality and Accessibility

Four experts (**9, 10, 15, 16**) also noted that ensuring data quality would provide a considerable informational challenge in the necessary reform of the data collection processes. For instance, SSF data is not always considered reliable **(10, 16)**. Still, Expert 10 also suggested that the reliability of the data is not the sole concern, but the transparency of how the data was collected is also a concern. Furthermore, extensive data that does not align with governance objectives is often collected **(10)**. This raises the question of how capable the information system is in ensuring the demands of international authorities, such as DG MARE, as they demand data collection processes to prioritize accuracy, reliability, and timeliness, along with secure storage and data accessibility (European Commission, n.d.-g). Still, even when publicly funded (e.g., through the DCF) data has been collected and considered legitimate, it might not always be accessible to everyone. Furthermore, the timeframe for receiving specific data could extend several years, depending on the nature of a request **(10)**. This might all follow due to the indications, as mentioned earlier, of a lack of multi-level transfer of information. However, it could also suggest that some actors in the information system are unwilling to facilitate an understanding of the extent to which data collection is ineffective.

6.2 Socio-ecological Assessments and Advice in the Multi-level Information System

6.2.1 Assessment and Advisory Processes

Both the **GFCM** and **ICCAT** provide stock assessments and advice in the Mediterranean. The ICCAT assesses advice related to tuna species, while the **GFCM's Scientific Advisory Committee (GFCM-SAC)** evaluates other Mediterranean species. The GFCM assesses Italy's adherence and execution of GFCM measures related to conservation, management, MCS, (quality of) data submission, and enforcement. The GFCM-SAC supports the GFCM multi-annual management plans, assesses fisheries and population data, and provides scientific advice to the GFCM (Simard et al., 2014). Based on these recommendations, management measures are discussed and potentially adopted at the annual meeting of the GFCM commission. There are also GFCM Working Groups in the GFCM-SAC, with one focused explicitly on the governance of SSFs, which also formulates advice based on SSF-related measures (Ramírez-Monsalve et al., 2021). Multiple external organizations participated in this Working Group on Small-Scale Fisheries (WGSFF) (GFCM, 2022)**.** Next to the GFCM and ICCAT, **JRC** also provides technical and scientific recommendations on the state of exploited Mediterranean stocks. Specifically, it assesses fish stocks and provides economic analyses of the fishery sector. However, the CFP does not consider it a direct provider of advice. So, all their advice must align with STECF's advice for it to be considered by DG MARE (Ramírez-Monsalve et al., 2021).

STECF, also through JRC data (and advice), specifically assesses demersal and small pelagic stocks in the Mediterranean. This occurs to direct requests from DG MARE, which STECF handles through their working groups (Ramírez-Monsalve et al., 2021). It then provides DG MARE with socio-ecological advice in EU fisheries governance relating to biological, economic, environmental, social, and technical considerations (Dörner et al., 2018; European Commission, n.d.-g). Annually, they review national fleet reports and consider the balance between the fishing opportunities of the different

fleet segments and the fishing capacity (European Commission, n.d.-d). This allows for considerations of fishing fleet capacity ceilings (in terms of kilowatts and gross tonnage) per EU country, effectively ensuring that any new fishing vessel can only enter the fleet if the same fleet capacity is removed (European Commission, n.d.-d). This is then formulated in STECF's Annual Economic Report (AER), which delivers a thorough overview of the economic performance of EU fishing fleets and is considered a crucial reference for EU fisheries governance (Dörner et al., 2018). Still, as the STECF (2018) also suggests, this data reflects national demographics. Furthermore, they suggest that advice representing smaller geographic areas would allow for an enhanced understanding of different dynamics and interactions within a community and make the social data more accessible to end users.

DG MARE also commissions and uses tenders, research projects, and the European Parliament's reports and hearings during legislative proceedings. Furthermore, Regional Sea Conventions, like **UNEP-MAP**, advise on fisheries management and conservation while not being inherently considered for integration into EU or Mediterranean SSF governance (Ramírez-Monsalve et al., 2021).

6.2.2 Informational Challenges in Assessment and Advisory Processes

As Ramírez-Monsalve et al. (2021) suggest, the ineffectiveness of data collection processes described in *Section 6.1.2* also impedes consequent assessment and advisory processes. Furthermore, it can result in researchers and decision-makers coming to partial or incorrect conclusions, impeding effective Mediterranean and local SSF governance (Ramírez-Monsalve et al., 2021).

Addressing Multi-level Differences in Assessment and Advisory Processes

Still, without considering data quantity and quality, four experts **(4, 11, 13, 16)** reflected on the challenge of coming to an adequate multi-level Italian SSF definition and the governance limitations of the current definition, as discussed in *Section 5.1*. Rather, the CFP definition was considered most effective if it reflected the relatively lesser ecological impact of Italian SSFs instead of reflecting physical features such as the length of the vessels **(4)**. Two experts suggested that considering passive gears has been a step in the right direction, as these generally have a lesser ecological impact than active gear types **(4, 13)**. Still, experts **(4, 11, 13, 16)** agreed with each other that the current CFP and EMFAF definition was the result of many discussions and that this is likely the best middle-ground that could be reached in the discussions, while not all necessarily agree with it. According to Expert 11, a significant portion of some fleets belong to vessels that do not exceed 12m in length and do not use towed gears. He also noted that you cannot manage things too granularly on a multi-level scale, as it would not be possible to define measures for each specific characteristic of a fishery individually. Still, he also noted that local complications can, indeed, arise as a result of this general definition. This indicates that even with the provision of large quantities of high-quality data on Italian SSF characteristics, the assessment and advisory processes in the state-led information system would likely never be able to facilitate an all-encompassing Italian SSF definition, at least on an international scale of governance, due to the challenge of addressing multi-level differences in these processes. Indeed, this impedes the likelihood that associated international regulations will also be effectively contextualized with consideration of all Italian SSF particularities and maintaining challenging implications on a local scale.

Advised Definitions of Italian SSFs Impeding Co-management

It was also found that assessment and advisory processes could impede co-management facilitation. For instance, Expert 16 expressed the challenges that the current CFP definition of Italian SSFs creates in the organization of CO.GE.PA. According to her, no consortia were formed since the decree, as fishers could not align their activities with this definition. Later, with changes in the

internal organization of the MiPAAF, another decree was issued, introducing a broader definition of SSFs encompassing a more comprehensive range of characteristics. However, these two decrees now co-exist without aligning well. Logically, this duality would also cause considerable confusion in implementation and might further impede processes related to co-management facilitation.

Conflicting Assessment and Advisory Processes

Outside of considering the definition of Italian SSFs, Cardinale et al. (2017) reflected on the general challenges that stem from the assessment and advisory processes. For instance, they suggest that it is essential to establish a transparent coordination mechanism for the activities of STECF and the GFCM-SAC to prevent "working group duplication" and ensure "working group synergy", as confusing situations are caused where advice on the same topic is following from both parties. They also hinted at the CEG's pulling mechanisms of DG MARE as excessively present, with continuous manager interference in the scientific process. As they suggested, this could also hinder the transparency and independence of the advisory process. Even if the work done by GFCM-SAC and STECF should theoretically result in efficient fisheries resources management, complications arise because of the considerable overlap between the work done by the two bodies and because of the absence of a clear distinction between their respective roles during this process (Cardinale et al., 2017). This already resulted in the GFCM Working on Demersal Species (WGSAD) having to review multiple duplicated stock assessments to reform it into a consensus report. STECF also considered multiple of these assessments valid, while GFCM rejected them (Cardinale et al., 2017). Notably, the interviewed experts did not address any of the informational challenges in the flows, which might indicate improvement in this regard since the research stems from 2017.

Still, the notion that multiple assessments were later considered invalid by STECF, while GFCM rejected them, shows that two different forms of advice can follow from the information system. This would indicate a waste of human resources and investments, discussed in *Section 8.3* as a shared informational challenge in CEG and non-state IG efforts. Furthermore, Cardinale et al. (2017) suggested that differences in advice on governance of the same stock within the same information system can also affect trust and hinder effective fisheries governance (Cardinale et al., 2017). As such, this might only exemplify how informational challenges can strengthen each other. In turn, this might mean that while experts did not directly reflect on the informational challenges stemming from the ineffectiveness of STECF and GFCM-SAC advisory processes, they might have reflected on other informational challenges that were partly the result of this ineffectiveness. Furthermore, when state authorities can question the advice of the state-led information system to take steps that would benefit co-management facilitation, it stands to reason that this also impedes these processes.

6.3 Italian SSF Representation in the Multi-level Information System

6.3.1 Stakeholder Involvement Processes

As suggested by Raicevich, Grati, et al. (2020), enhancing the lobbying capabilities of Italian SSFs on both national and international fronts could aid their recognition. Four experts **(5, 6, 7, 9)** also expressed that advisory councils aid the process of contextualizing regulations. It is important to emphasize that Mol (2006) suggests that non-state actors can also considered as part of the CEG system (see *Section 2.1.1*). He also explicitly addressed stakeholder working groups or advisory councils as providing platforms for such actors. Thus, all actors discussed in this section are not considered non-state approaches that base their practices on the principles of IG. Those non-state IG approaches are discussed in *Chapter 7* and, to some extent, in *Chapter 8*.

The Mediterranean Advisory Council (MEDAC) recommends DG MARE on Mediterranean fisheries governance of socio-ecological aspects in management measures and share data in support of their

recommendations (European Commission, n.d.-a; Kari Stange, 2017). It is mandated in the CFP that fisher representatives hold 60% of the seats and that the remaining 40% is allocated to other interest groups (Kari Stange, 2017). Thus, the MEDAC provides a platform for the representation of Italian SSFs, but mainly on an international scale (Kari Stange, 2017; Raicevich, Grati, et al., 2020). The **Low Impact Fishers of Europe Platform (LIFE)** represents SSF organizations in 15 EU member states and is directly associated with more than 10.000 fishers, performing Mediterranean capacity building and advocacy activities and engaging directly with EU organizations, RFMOs (such as the GFCM and ICCAT) and national state authorities (LIFE, 2023; Percy & O'Riordan, 2020). Indeed, LIFE's work in contextualizing regulations was also mentioned by three experts **(9, 10, 13)**. For instance, it was suggested that LIFE ensures a better recognition of SSFs in governance processes **(9)**. Contrary, MEDAC members, like **FEDERPESCA**, **Coldiretti Impresapesca, AGCI Agricatal**, **Legacoop Agroalimentare**, Federcoopesca, and Legapesca also represent a mix of LSFs and SSFs (MEDAC, n.d.; Raicevich, Dubois, et al., 2020). Multiple Italian and European organizations also exclusively represent recreational fisher organizations in the MEDAC, such as FIPSAS (Federazione Italiana Pesca Sportiva e Attività Subacquee) (Grati, personal communication, 12 October 2023).

In support of the objectives of the GFCM 2030 Strategy and the RPOA-SSF, the FAO's "**Friends of SSF Platform"** was created to facilitate stakeholder collaboration. This platform is co-coordinated by the GFCM and the World Wild Fund for Nature (WWF), including other members like LIFE and the MEDAC (GFCM, 2022). Among other things, they assess how the RPOA-SSF is implemented in Italy and launched the "**Small-Scale Fishers Forum"**, which is intended to provide a space for Mediterranean SSFs to convene, exchange info on good fishing practices and gain insights from each other (GFCM, 2022). As Expert 9 suggested, the SSF Forum also allowed a better recognition of the challenges surrounding non-indigenous species that Mediterranean SSFs face. In turn, traditional governance processes could also emphasize these issues by ensuring decision-makers are familiar with key issues facing the SSF industry.

Non-state actors are often included to represent public interests; in Italy, this role seems to be predominately taken by **WWF**. They are active in 10 Mediterranean countries, including Italy (WWF, n.d., 2018). According to Expert 1, WWF is considered an NGO with a relatively more scientific approach. Furthermore, he noted that they produce studies with some state-endorsed scientific institutions, but these studies are not considered in the multi-level information system to facilitate regulatory processes. Still, according to Expert 16, WWF is the only NGO in the CEG that regularly interacts with the MiPAAF, especially regarding SSF matters. It was suggested that while WWF does not have a formally recognized role and is not part of national fisheries tables, it does engage at the national level in policy and advocacy efforts to seek better recognition of the role of SSFs **(12)**. According to WWF (n.d.), they prioritize the well-being of communities and consider that this will reduce cases of mismanagement and IUU practices preceding overexploitation.

Six experts **(1, 7, 8, 11, 12, 16)** also explicitly mentioned that WWF plays a role in contextualizing regulations. Expert 16 noted that WWF advocates for reorganizing fisheries legislation for SSFs, including legislation recognizing local specificities. As such, WWF likely influences legislation not necessarily on the data they collect, as this data can currently not be recognized in formal legislative processes but through their advocacy efforts. This also follows from the reasoning of five experts **(1, 9, 11, 12, 16)**. who suggested that WWF aids the representation of Italian SSFs. For instance, Expert 12 noted that they actively work with stakeholders to address local conflicts between fishing fleets. She mentioned that Legacoop Agroalimentare also works with WWF on various SSF projects to promote and support SSFs. Indeed, WWF (n.d.) also suggests that they partake in policy development and formulation of economic alternatives. As suggested in *Section 5.2.1*, these economic alternatives also

have been reasoned to provide a basis for more contextualized regulations, meaning that the WWF might also provide indirect facilitation through this. Five experts (**1, 9, 11, 13, 16**) also suggested that WWF aids in co-management facilitation. According to Expert 9, they have successfully developed co-management sites throughout the Mediterranean, developing relationships with fishers, state authorities, and local researchers to create co-management committees. She also noted that WWF has staff in the field who can work more actively with fishers than state authorities can. Such collaboration also concerns the development of co-management approaches, aiding SSFs' access to decision-making processes, legal representation, and societal recognition (WWF, n.d.).

Apart from this, some more NGOs have been mentioned that are present in the stakeholder involvement processes within CEG, with the capacity to aid the contextualization of regulations. For instance, Legambiente was mentioned by three experts **(1, 8, 13)**. As suggested by Expert 8, they play an environmental advocacy role in Italy while also involving SSFs in their projects. Marevivo was also mentioned as an NGO that played a role in MPA governance and had a positive impact by advocating for funds and demonstrating to MiPAAF how crucial effective data collection is **(16)**. Furthermore, AKTEA has been noted by Expert 13 as aiding the contextualization of regulations by representing the voice of women in the Italian fishing industry.

This demonstrates that while non-state IG actors are primarily considered in this thesis, non-state actors can also play a considerable role in facilitating the contextualization of regulations and co-management of Italian SSFs. Indeed, this could already be seen in how they respond to the pulling mechanisms of CEG, in which their particular successes seem especially present in stakeholder involvement processes.

6.3.2 Informational Challenges in Italian SSF Stakeholder Involvement

While six experts **(7, 8, 9, 13, 14, 16)** mentioned different forms in which the state-led information system provided representation options, six experts **(2, 4, 9, 11, 13, 14)** also mentioned that the representation of Italian SSFs should improve.

Lack of Communication toward Italian SSFs

According to Expert 16, most fishers do not see support from accountable representatives, and the national representatives are more focused on addressing issues of LSFs. According to Expert 4, the main problem of Italian SSFs is that no national organization exclusively represents their interests. On the contrary, Expert 11 also suggested that the feeling of not being fully represented could be caused by a lack of knowledge of how stakeholder involvement processes work. This might also explain why fishers attending the SSF Forum were suggested to be happy with how they could represent themselves, as they were actively aware of these processes **(9)**. Logically, these same fishers might have been less content without this knowledge, indicating the importance of promoting these stakeholder involvement processes toward SSFs. The challenge of ineffective representation was also considered by Grati & Perretta (2022) to be present in lower levels of governance, who presented Adriatic and Ionian challenges in SSF representation as indicative of similar challenges in other administrative regions. This concerned perceived insufficient communication with local administrations, a lack of representation and aggregation among SSFs, and the notion that older fishers are more hesitant to join fisher networks or clusters. Expert 2 also noted that a systematic involvement in sub-national consultation processes would be beneficial, as the sub-national and local contexts have different features and expectations. She also noted that fishers should not only be involved in managing the current measures but also consulted on how to design novel measures. However, given that SSFs might also be unaware of international stakeholder involvement processes,

the information system reform would benefit from considering how effective communication toward SSFs is.

Balancing Interests

Five experts (**2, 7, 9, 11, 15**) also addressed balancing interests in stakeholder involvement processes. According to Expert 7, ensuring inclusivity while balancing different interests in decision-making is always challenging. Expert 15 also addressed this dilemma, as decision-makers overlook SSF complexities while primarily representing national economic and political interests. In that case, the LSF industry would likely always be favored due to its relatively more considerable economic power, as is also addressed by Raicevich, Grati, et al. (2020). It was also suggested that the international representation of SSFs cannot effectively occur through fisheries representatives representing a mix of LSFs and SSFs, as this only favors SSFs when there is no conflict of interest (**13**). Because all Italian parties in the international councils discussed in *Section 6.2.1* only concern representatives with such a mix, this already seems to provide quite a challenging status quo to change. This is also supported by Percy & O'Riordan (2020), who suggest that adjusting the MEDAC's seat allocation in favor of SSFs would be met with the reluctance of the LSF sector to relinquish their representation in this council. Expert 13 also noted the strength of the LSF lobby on an international and national scale and the challenge of having the voice of Italian SSFs heard in an equal form. As Percy & O'Riordan (2020) suggest, LIFE is unique in its representation of SSF interests, as other fisheries organizations would have diluted their interests due to LSF interests dominating negotiations. However, they are not a member of MEDAC. With the MEDAC's direct advisory role toward DG MARE, the interests of Italian SSFs would likely benefit more from direct international representation in the MEDAC. Raicevich, Grati, et al. (2020) state that this is severely limited as no national or local organizations exclusively serve them in the MEDAC.

Indeed, it became apparent that this challenging conflict between SSFs and LSFs in stakeholder councils is not only an international challenge. Expert 2 noted that guiding discussions on associated spatial conflicts between these industries can also be a local challenge. As such, she expressed the need to involve consortia that solely represent SSF interests. This notion was also shared by Expert 11, as he noted that developing co-management schemes is particularly challenging due to difficulties in finding representatives for different sectors and achieving agreements. According to him, the distinction between LSFs and SSFs can be a significant barrier, especially when there is overlap in the exploited species and utilized areas. Interestingly, Expert 3 also mentioned that contextualizing SSF regulations would mean that SSFs must be better protected against the current threats, of which conflicts with LSF are a part. This raises the question of how such threats can be contextualized in regulations when the perceived threat receives considerably more representation in stakeholder involvement processes than the SSF.

Language Barriers in Stakeholder Involvement Processes

Two experts (**9, 10**) also suggested that correct interpretation must be facilitated to ensure adequate representation, as not all fishers speak English, and legislative terms are not understood by all either. Thus, Expert 9 noted that the capacity for correct interpretation must be ensured so that everyone can speak together in the same room. Expert 10 said this is not always effective on a European level, where English is mainly used and not everything is always translated. Without addressing the need for enhanced interpretation in CEG processes to represent Italian SSFs, Expert 14 also discussed the challenge in communication with fishers from different regions, as dialects can differ considerably. Thus, it seems reasonable to assume that the translation from Italian to sub-national dialects can also challenge the interpretation in processes that facilitate representation. Indeed, the value of practical translation efforts in fisheries participation processes was also addressed by Mackinson et

al. (2011). They also considered the value of correct interpretation to be especially important in facilitating fishery participation in Regional Advisory Councils, such as the MEDAC. Thus, these language barriers can also limit the reform of the information system to reach more contextualized regulations and co-management of Italian SSFs.

6.4 The Informational Challenges of a Multi-level Approach

Indeed, informational challenges were already addressed in *Sections 6.1.2, 6.2.2, and 6.3.3* related to the multi-level differences in specific information flows. However, eleven experts **(1, 2, 4, 7, 9, 10, 11, 12, 13, 15, 16)** also suggested that the general multi-level differences in the CEG approach provide an informational challenge in itself.

Jurisdiction to Reform Information Flows on Other Governance Scales

According to Expert 9, the level of engagement with SSFs can vary widely between countries and administrative regions. Furthermore, it was noted that even when international state authorities, such as the GFCM, desired change in some national information flows, they would have no national jurisdiction to demand this. This provides a general challenge where each enhancement of multi-level information flows must be assessed based on legal jurisdictions and whether issues stem from an international or national level and plan **(9)**. Furthermore, as discussed in *Case 2 in Section 5.3*, ICCAT regulations surrounding pelagic species seem to lack contextualization in some sub-national and local regions. Still, according to Expert 15, while the ICCAT could potentially encourage improvements in the contextualization of these regulations, their impact might be limited as the decisions are made by consensus among ICCAT member countries. Indeed, this has little to do with how information flows can be enhanced but more with which actors can enhance them. To some extent, this is closely related to the informational challenge of political willingness to reform the information system, as is further discussed in *Section 8.6*. However, it is essential to note that even if political willingness is present to reform the information flows in other levels of governance, the jurisdiction to enforce this is not a given.

Bureaucratic Challenges

Two experts **(11, 16)** also reflected on bureaucratic challenges that can limit the enhancement of the CEG information system. For instance, Expert 9 suggested that previous bureaucratic challenges impeded funding of a monitoring program for Italian SSFs within MPAs. As she suggested, these projects started two years later than intended due to these challenges. Such challenges might also limit the enhancement and validation of current and novel information flows. Literature also refers to bureaucratic challenges that impede some projects with similar features. The FishMPA Blue 2 project aimed to assign Local Governance Groups (LGGs), which gathered MPA managers and local SSFs (Di Franco et al., 2020). Three Italian LGGs acknowledged a needed intervention that demanded more involvement of SSFs in decision-making through collaborative platforms by increasing the number of MPA meetings and allowing a better organization of SSFs through FLAGs (Di Franco et al., 2020). Furthermore, a need was expressed for engaging with SSFs in monitoring activities to improve the knowledge and ownership of the socio-ecological system. Proposed ideas indicated that this could be achieved by building the financial and staff capacity of MPA management and providing MPA staff with legal authority to sanction illegitimate actions. The proposal of one LGG to implement a video surveillance system with 24-hour/day coverage of an MPA received the support of all involved parties. The implementation was, however, impeded by bureaucratic and legislative challenges (Di Franco et al., 2020). It was also found that the perceived effectiveness of governance interventions differed per MPA, which was reasoned to be due to different socio-ecological contexts of MPA (Di Franco et al., 2020). This also suggests that uniform management decisions do not fit every local situation similarly, potentially causing positive participation in one region and less so in others.

Multi-level Differences in Successful Contextualization and Co-management Efforts

Expert 13 noted that fisheries governance works best at the local level and that management at the national level can sometimes be considered too broad. Furthermore, Expert 1 noted that co-management is studied north of the Adriatic and in Sicily (likely referring to the LMP discussed in *Section 4.3)* and that local successes are present. Still, he also emphasized that these could only be considered particular actions that do not bring substantial national change through national policies. Indeed, the effectiveness of a more local approach toward co-management facilitation was also suggested to be more valuable by Bennett, Calò, et al. (2020). Furthermore, they noted that MPA governance finds more support for regulations when perceived as legitimate and having an acceptable social impact. Even more so if social equity follows from recognitional, procedural, and distributional equity. According to Bennett, Calò, et al. (2020) this is most effectively realized locally due to the heterogeneity and site-specific differences in MPA governance. This also followed from Expert 1, who suggested that SSFs differ considerably sub-nationally and desire specific solutions, which cannot follow from general regulations of EU fishery policies **(1)**. The seemingly higher effectiveness of contextualization and co-management of regulations on more local scales of governance also raises the question of whether investments to reform the multi-level information system would be best spent locally, too. On the one hand, this would follow logically, as it seems to be suggested that this would reinforce the effectiveness on a scale of governance that could not be replicated on a larger scale either way. On the other hand, it might be that the ineffectiveness of the other scales of governance in contextualizing regulations and facilitating co-management is especially the result of the ineffectiveness of information flows on these scales, emphasizing the need for such investments to be spent there, as well.

6.5 Expert Attitudes on Effectiveness of the Conventional Information System

6.5.1 Effectiveness of Facilitating Contextualized Regulations

When prompted, thirteen experts **(1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 13, 14, 16)** suggested that multi-level regulations are not sufficiently contextualized. For instance, Expert 8 noted that for both SSFs and LSFs, the socio-economic sustainability was not sufficiently considered in regulations. Expert 2 also suggested a need to put more effort into fostering the socio-economic aspects if acceptance of the measure was desired. Di Cintio et al. (2022) also suggested that the lack of socio-economic data limits effective resource management and the identification of suitable market-based solutions to counter the effects of economic crises. Experts 5 and 6 also noted that a more accurate study should be made of the dynamics that affect the various problems taken into consideration by the regulations. They suggested that it is not enough to consider only the scientific aspects but that an identification of the social repercussions as well as possible solutions for these repercussions needed to be identified before regulations were implemented. This also aligns with the research of Vindigni et al. (2016), as they noted that the limited capacity to manage SSFs could result from CEG methods that were not completely adapted to their characteristics. They also suggested that the management approaches were mostly focused on conservation objectives and that this has resulted in multiple regulations that often have had adverse indirect effects on the livelihoods of SSFs.

Five experts **(4, 7, 9, 11, 13)** also suggested that the CEG system already works toward contextualizing regulations. Expert 13 noted that the current CEG system provides a good framework and complements the concept of generic regulations and a regionalized approach, while improvement is needed in how regulations are formulated. In contrast, Expert 9 suggested that the GFCM management plans provide some flexibility in how they can be implemented and that it is up to national and local administrations to ensure an effective implementation on a local scale. She provided the example of a management plan demanding the closure of fishing activities for a few

months but that the specific months for this closure could be decided at the local level. As such, it could be reasoned that the governance framework does provide sufficient legislative space to ensure contextualization. However, the challenge seems to arise in whether the information is sufficiently available to base the regulations' contextualization or whether state authorities do not sufficiently utilize this information.

Notably, Expert 4 noted that he did not see the challenge of Italian SSFs facing regulations that are not sufficiently contextualized, as the LSFs were mostly restricted. In contrast, SSFs were more or less allowed everywhere, even inside MPAs and the coastal areas, which are also the most productive. Still, as follows from *Section 5.2.2 and Case 3 in Section 5.3*, within these MPAs, local contexts can present challenging situations in the implementation of governance, as competition with LSFs can also take place within MPAs and Italian SSF governance is perceived by Di Lorenzo et al. (2022) as generally poor. While he did not state that Italian SSFs face considerable threats stemming from competition, he did not seem to consider that such threats should be better reflected in regulations.

6.5.2 Effectiveness of Facilitating Co-management of Italian SSFs

Seven experts **(1, 2, 9, 11, 12, 13, 16)** suggested that state authorities should provide a legislative framework for co-management. According to Expert 9, the CEG system should devolve power to a more local level by providing a governance structure in a determined geographical area so that co-management committees can most effectively manage their area. She noted that MPAs provide most options for this. However, she suggested that more support was needed for co-management committees, especially for those that do not consider MPAs in their measures, through more active participation of state authorities. It was also noted that the Spanish region of Catalonia has had considerable success with its co-management approach, in large, due to the national administration effectively providing a legal framework and supporting local committees that devolved decision-making power. Expert 13 also shared that more legal frameworks were needed to enable co-management. According to her, the lessons learned in Catalonia could also be exported to Italian regions. WWF also developed guidelines for establishing co-management at the national level to serve as the foundation for developing a decree. However, there never seemed to be a genuine political willingness to adopt and move forward with these initiatives **(16)**.

Indeed, this also relates to the identified challenges stemming from the multi-level approach currently applied in CEG. When addressing these challenges, experts suggested that a more local approach would aid more effective governance. Moreover, it was noted that more promotion was needed through local authorities, such as the Italian regions or FLAGs, to ensure that co-management is pushed, promoted, and recognized locally. The example of the Sicilian LMP discussed in *Section 4.3* was also addressed by Expert 16, who noted that this is the only LMP with formal recognition at the national level. Furthermore, she noted that WWF also promotes principles of the Catalonian legislative framework to be applied in the form of an Italian ministerial authorization as well as a formal approval and a local decree issued by the Coast Guard so that any management decision made by co-management bodies become mandatory **(16)**. This would reduce the steps addressed in *Section 4.3* for any co-management committee to take and seems to reflect the principles of self-governance more than those of co-management.

It should be noted that these suggestions would primarily reflect the necessity for a national legislative framework. However, the Resolution on Co-Management of Fisheries in the EU (2023) also calls for a European framework that can provide administrative, economic, and advisory tools that are needed for the EU member states and the fishing industry to effectively adopt co-management models (EU Monitor, n.d.; Resolution on Co-Management of Fisheries in the EU, 2023). This

resolution also addressed the necessity for flexibility and unification of criteria and tools that allow communication between the scientific community and state authorities to improve fisheries management trust. Indeed, Bennett et al. (2020) also pointed out that the global conservation community needed to improve policies and guidance of this model, and state authorities need to facilitate in financial and staff capacity to support conservation planning in MPAs and governance that pursues social equity together with progress toward conservation objectives. Still, it remains unclear how the DG MARE will follow up on this with advice on the necessary tools to be utilized by Italian state authorities.

6.6 Conclusive Remarks on Informational Challenges in CEG

Multiple state-appointed institutes perform interconnected activities within the current multi-level information flows to facilitate data collection, assessment and advice, and stakeholder involvement. It should be noted that all institutes in this system seem to put particular efforts into attempting to perform these processes effectively. Still, experts have identified unique informational challenges within each of these flows.

Generally, the data collection processes have been considered ineffective in collecting socio-ecological data. However, these multi-level processes are also considerably limited by the multi-specific nature of Italian SSFs. Furthermore, an exciting notion was raised in the challenge provided to Italian SSFs as they must meet more stringent obligations surrounding data provision through Regulation (EU) 2023/2842 (2023). It is considered that this will add to the challenges that Italian SSFs face. At the same time, the additional data would also improve the data quality and quantity necessary for the facilitation of contextualized regulations and co-management.

Still, when one does not consider the data quantity and quality in the state-led information system, informational challenges can also be expected in the assessment and advisory processes. Again, multi-level differences proved to provide an obstacle. Still, in this case, it related to how the multi-specific nature of Italian SSFs impeded the likelihood of coming to an adequate, all-encompassing definition of an Italian SSF. Thus, it seems unlikely that international regulations will ever be effectively contextualized with consideration of all their characteristic, which will continue the challenging implications that Italian SSFs face locally. Indeed, it was also found that international and national decrees can co-exist on what defines Italian SSFs and that the resulting confusion might impede co-management facilitation. Likewise, misalignment in the assessment and advisory processes has also resulted in confusing situations where the advice of STECF and the GFCM-SAC on the same governance case differed considerably. While this is, in part, an indication of wasted energy that might be better spent on enhancing the information flows in the multi-level information system, it might also impede the facilitation of contextualized regulations and co-management of Italian SSFs, as the credibility of advice related to such facilitation could be questioned.

Informational challenges can also be expected in the reform of the stakeholder involvement processes. It was noted that Italian SSFs are not only considered ineffectively represented in these processes but can also be insufficiently aware of them due to a lack of communication. Furthermore, it has been noted that the state must ensure practical interpretation efforts for Italian SSF operators to understand these stakeholder involvement processes. Still, even when representation could allow for a compelling portrayal of their voices in these processes, it has been considered incredibly challenging to hear them when other parties with more political and economic power are present. LSFs have been found to have a strong presence around the negotiating table. At the same time, experts regarded them as the providers of one of the most significant existential threats to Italian SSFs.

Indeed, the general multi-level approach within the state-led information system has also been addressed as an informational challenge. This became especially evident when identifying necessary improvements to information flows might not receive effective execution, as the enhancement of these flows might have to be performed on scales where an actor does not have the jurisdiction to achieve the enhancement. Furthermore, the associated bureaucratic challenges of this multi-level approach have already resulted in instances where perceived enhancements to the monitoring of Italian SSFs were impeded due to bureaucratic difficulties in the execution. It was also suggested that the local scale will always be the most effective for the information system to facilitate contextualized regulations and co-management. Indeed, this raises the question of how this could be enforced on the larger scales of CEG.

The presented informational challenges should not be considered as all-encompassing but as an indication of the limitations that the effectiveness of the state-led information system currently experiences. The literature review of national and local information flows was more limited than that of international ones. However, the national and local information flows also received considerable reflection from experts during the interviews.

As follows logically from the considerable list of identified informational challenges, experts shared a general conviction that the CEG system does not effectively facilitate the contextualization of regulations. Indeed, the absence of socio-ecological characteristics of Italian SSFs was widely regarded, emphasizing the lack of consideration of socio-economic characteristics. Furthermore, it was noted that social repercussions of regulations must be better considered as possible solutions for these repercussions before implementation takes place. Still, it was also addressed that the system does provide a framework in which contextualization of regulations can take place. Still, the informational processes within the system limit such ambitions. Indeed, in *Section 4.3,* steps were already provided that would allow for the facilitation of CO.GE.PA and LMPs. However, only one Italian LMP has received national recognition, indicating how effectively these steps are utilized. This is also why multiple experts suggested that the CEG system must provide a legislative framework with more supportive capacity to the state-led information system. Indeed, the Resolution on Co-Management of Fisheries in the EU (2023) might provide a step in the right direction with some administrative, economic, and advisory tools. Nonetheless, considering the current state of contextualized regulations and co-management of Italian SSFs, the state-led information system seems to be considerably impaired by the informational challenges it experiences. It looks like the system intends to facilitate better recognition of Italian SSFs. Still, it might be that its ineffective approach toward mitigating and tackling informational challenges limits the achievement of this ambition and the likelihood of an effective information system reform.

This chapter demonstrates that the state-led information system is currently considerably ineffective in facilitating contextualized regulations and co-management of Italian SSFs. Furthermore, considerable efforts must be anticipated in the reform of the information system to increase these facilitative capacities. *Chapter 7* will show that some of the CEG efforts in overcoming these challenges are directly related to non-state IG's challenges to facilitate contextualized regulations and co-management of Italian SSFs. However, *Chapter 7* will also show how non-state IG can directly support CEG efforts in overcoming the challenges the system currently experiences.

7. Recognizing Italian SSFs through Non-state IG

Given the challenges the current state-led information system faces, there appears to be a considerable need for non-state IG's capacity to solve crises beyond state control, as Mol (2006) and Langhorne (2005) suggest. This chapter combines expert attitudes and literature to provide insight into this capacity to facilitate contextualized regulations and co-management of Italian SSFs. The value of non-state IG was expected not to be bound to Italian circumstances. Thus, non-state approaches with the capacity to assist in the production, verification, and control of information and the facilitative capacity for contextualizing regulations and co-management of SSFs were explored, as discussed in *Section 3.2*. Literature on fisheries governance in the Syrian Arab Republic, Lebanon, and Tunisia was found to be limited. Also, a nearly absent amount of literature discussed active non-state approaches in these countries. Hence, the exploration of non-state approaches was limited to Italy, Greece, and Cyprus, which resulted in the selection of the two non-state approaches of the MSC and ABALOBI. This chapter also triangulates expert-identified informational challenges and their effects on the general implementation of non-state IG and the more specific implementation of MSC and ABALOBI. Ultimately, this allowed for a comparison with the effects of the informational challenges identified in *Chapters 6 and 8*, provided in *Chapter 9*.

Sections 7.1 and 7.2 introduce the MSC and ABALOBI, the reasons for their selection in this thesis, and how aware interviewed experts were of these non-state approaches. *Section 7.3* provides experts' attitudes toward non-state approaches in general, as well as toward the MSC and ABALOBI, in their capacities to, directly and indirectly, aid the facilitation of contextualized regulations and co-management of Italian SSFs. *Section 7.4* provides the effects of expert-identified informational challenges in non-state IG. Conclusive remarks on the applicability of non-state IG and associated informational challenges are provided in *Section 7.5*.

7.1 The Marine Stewardship Council (MSC)

7.1.1 Introduction of the MSC

The MSC is among the most influential global eco-certification programs (Nyiawung et al., 2021). They use their ecolabel and fishery certification program to aid sustainable seafood supply by promoting sustainable fishing practices (MSC, 2024g). These market-driven incentives reward certified fisheries with positive societal and environmental outcomes (Melnychuk et al., 2022). Even though the MSC has received critique (Bush et al., 2013; Christian et al., 2013; Gulbrandsen, 2009; Le Manach et al., 2020), they are generally considered the “golden standard” for sustainable wild-capture fisheries (Bush et al., 2013; Foley, 2013; Hønneland, 2020; Nyiawung et al., 2021).

The MSC’s Informational Governance Principles

According to Toonen & Mol. (2013), the MSC program is centered around information and informational processes. They also suggest that the MSC’s capacity to ensure quality, reliability, and acceptance of information and transparency in how information is used and how the program is governed partly decides the MSC’s legitimacy and why it holds the authority to complement state governance. This also follows Bush et al. (2017), as they suggest that the success of the MSC is the result of how it supports information systems in CEG. A fishery certification process consists of multiple stages. Firstly, a fishery can undergo an optional pre-assessment to identify what might limit the chance of becoming certified. The next stage is a full assessment consisting of audits, stakeholder input, and a peer review process. When this stage is successfully finalized, and all the Performance Indicators (PI) are at the level of the MSC Fisheries Standard, the fishery receives a certification for five years (with possible conditions requiring further improvement) (MSC, 2024b). These PIs follow from the three MSC Principles, demanding that: (1) the fishing activity on the target stock must be at a that ensures it can continue indefinitely; (2) fishing operations must be managed

to maintain the structure, productivity, function, and diversity of the ecosystem; (3) the fishery must comply with relevant laws and have a management system that is responsive to changing circumstances (MSC, 2024d). Organizations in the supply-chain that want to make claims about MSC certified products must adhere to the MSC Chain of Custody (CoC) Standard, ensuring that all MSC certified products are traceable and kept separate from uncertified products (MSC, 2024h). Similarly to the Fisheries Standard, CoC certified parties must meet the following principles: 1) certified products are purchased from a certified supplier; 2) certified products are identifiable; 3) certified products are separated from non-certified products; 4) certified products are traceable, and volumes are recorded; 5) the management system addresses the requirements of the CoC Standard (MSC, 2024h). This set of actors and activities that the MSC arranges to collect information, verify information, and the routes for transmission of the information, as well as arrangements to manage uncertainty and trust, are what Mol (2006) also considers as defining characteristics of a non-state IG actor. Indeed, he also explicitly addressed the MSC with this definition.

The IG principles also stem from their scientifically based assessment procedures and applied governance structure (Bush et al., 2013). The MSC program also includes credible and effective informational logistics and infrastructure (Toonen & Mol. 2013). The certification processes related to the Fisheries and CoC Standard are performed by independent Conformity Assessment Bodies (CABs), which employ auditors without ties to the audited party and the MSC (MSC, 2024d). These CABS must meet requirements to prevent risks to the integrity of the MSC program. Their activities are overseen by Assurance Services International (ASI). Furthermore, all assessors must follow ISO 17065. This International Standard ensures that assessors operate competently, consistently, and impartially. Each assessor must follow online training and meet qualification requirements to perform the audits, publish their assessment reports on the MSC website, and include an independent peer review of performed fishery assessments (MSC, 2024d). After certification, fisheries and commercial parties are also audited yearly by CABs to ensure that they are still meeting each principle and the associated conditions of the Standards (MSC, 2019, 2024b).

The MSC's focus on IUU practices

IUU practices receive considerable attention in certification processes, as CABs are explicitly instructed to ensure that assessed fisheries are not associated with such practices (Longo et al., 2021). When IUU risks exist, they must be at a level where measures, like assessments and harvest control rules accompanied by estimations of IUU impacts on the targeted species and ecosystems, are certain to maintain the affected populations within sustainable limits. All certified fisheries must also adhere to relevant laws, and IUU practices are considered in assessments and audit reports. IUU-blacklisted fishing vessels can also not receive an MSC certification (Longo et al., 2021).

Ineffectiveness in regulatory frameworks can motivate IUU fish practices to arise, but economic incentives drive their persistence (Longo et al., 2021). This can be mitigated by effectively separating illegally sourced seafood from legitimate and well-managed sources. Similarly, ensuring that the supply-chain does not allow substitution or mislabeling of illegitimately sourced catch could enhance traceability. As such, the MSC is also a tool to address IUU fishing (Longo et al., 2021). As Song et al. (2020) suggest, Italian SSFs must be motivated to share data on their fishing practices. The MSC's program is facilitated by providing market-driven incentives to develop practices legitimately aligned with conservation objectives (Melnychuk et al., 2022; MSC, 2024g). With this in mind, the societal and environmental outcomes that the MSC provides fisheries as incentives would likely also aid the recognition of legitimate Italian SSFs in efforts to contextualize regulations and facilitate co-management.

7.1.2 The MSC's Approach Toward SSFs

The MSC has been selected as an example of a potentially applicable non-state IG approach, as it met all the selection criteria mentioned in *Section 3.2*. It should be noted that no fisheries from the Syrian Arab Republic, Lebanon, Cyprus, and Tunisia are engaged in the MSC program (MSC, 2024i, 2024f). However, all fisheries there have the option to engage with the program. Furthermore, the program also has activities focused on SSF governance in Italy (MSC, 2024a).

The MSC Pathway to Sustainability Program

Literature often suggests that the MSC program primarily focuses on LSFs and lacks accessibility for SSFs (Blackmore et al., 2015; Le Manach et al., 2020; Wakamatsu & Wakamatsu, 2017). The MSC also acknowledged that SSFs might face relatively more challenges in certification processes due to data limitations in setting science-based catch restrictions, ineffective governmental structures to support compliance and enforcement, insufficient skills and knowledge to implement sustainable progress measures effectively, knowledge of the MSC Fisheries Standard and its applicability, or not enough resources to meet financial or administrative requirements of certification processes (MSC, 2022, 2023g). Furthermore, Italian LSFs are likely more aware than SSFs of how to apply for European funds that support sustainable progress. This, in turn, also increases the likelihood of engagement (Duque, personal communication, July 28, 2023).

The MSC also created the Pathway to Sustainability program (henceforth referred to as the PSP), providing SSFs with tools, training material, and structured improvement progress toward the MSC Fisheries Standard, whether it is intended to result in an MSC certification or not (MSC, 2024f). On the one hand, this includes the In-Transition to MSC (ITM) program, which can support SSFs committed to becoming MSC certified. Within the ITM Program, fisheries must use improvement (benchmarking and tracking) tools and templates to perform pre-assessments and reporting activities of their sustainable progress against the MSC Standard and set up action plans. There are also regular audits to assess this progress. The ITM Program participants can also apply for financial support from the Transition Assistance Fund, which is part of MSC's Ocean Stewardship Fund (OSF) (MSC, 2024f). No Italian fisheries are active in the ITM program at the time of writing, but SSFs in all countries can apply (MSC, 2023). On the other hand, the Pathway Projects provide a collaborative framework between national and regional fishery stakeholders from different sectors interested in facilitating the sustainable progress of participating fisheries. Like the ITM program, fisheries in the Pathway Projects are provided with guidance in their sustainable progress based on the improvement mentioned above tools and templates (MSC, 2024f). However, fisheries are not incentivized to achieve MSC certification or be audited for their progress. Still, they can take part in the Capacity Building Program and follow up with participation in the ITM Program (MSC, 2024f).

Stakeholder Critique on the MSC Pathway to Sustainability Program

Literature also suggests that legitimacy cannot credibly be considered to inherently follow from any level of association with the MSC program. It has been suggested that the MSC's support of certified and yet-to-be-certified fisheries can also undermine the program (Bush et al., 2013; Bush & Oosterveer, 2015). This critique was mainly directed at the MSC's support of Fishery Improvement Projects (FIPs) that utilize the MSC Standard as an expressed objective to gain better market positions (and powers) without these fisheries effectively following up on objectives. In turn, this affects the credibility of any party associated with these FIPs, among others being the MSC (Bush et al., 2013; Bush & Oosterveer, 2015). Still, the MSC responded to this challenge by creating its Benchmarking and Tracking Tool (BMT), which allows anyone to determine how a fishery in an FIP is progressing concerning conditions provided in the pre-assessment and certification processes. FIP managers and market parties are now utilizing the BMT to more credibly control and monitor progress toward expressed objectives (Bush & Oosterveer, 2015). Bush & Oosterveer (2015) suggest that the provision of the BMT and other MSC tools and protocols is a passive strategy that maintains

the MSC's credibility and authority while also creating an opportunity that what is provided is not used as intended. According to them, this might also lead to future controversies that are difficult to control due to association with these instruments. Still, the papers of Bush et al. (2013) and Bush & Oosterveer (2015) also precede the MSC's developments regarding the more active engagement with SSFs in the form of the PSP. As such, they mainly discuss risks to the program without having been able to reflect on the benefits that the MSC can have in engaging with FIPs, as those suggested by Longo et al. (2021). For instance, they noted that this engagement motivates SSFs to pursue a sustainable pathway. Furthermore, the Fisheries Standard can also be used to assess gaps in a fishery's performance that keep them from aligning with best fishery practices. This also aids them in prioritizing improvements that have the most effect.

The MSC Pathway to Sustainability Program in Italy

At the time of writing, 14 active Pathway Projects are running worldwide, spanning 18 countries (MSC, 2024f). One of these projects is called the "BluFish project" in Southern Italy, which provides a platform for cooperation between fisheries, NGOs, commercial parties, research agencies, public administrations, and state authorities (MSC, 2024a). Through this, the MSC aims to increase access to necessary resources for all actors, have them develop new skills, facilitate a stronger sense of responsibility for exploited socio-ecological systems, and more conscious sustainable progress (MSC, 2024a). The start of this project is focused on mapping fisheries in the subjected Southern Italian regions. After this, a third-party assessor conducts a large-scale gap analysis to see how fisheries perform against the MSC Standard. At the end of the project, all involved actors formulate an action plan to improve the performance of participating fisheries against the MSC Fisheries Standard. This all serves the objectives of BluFish to improve the knowledge of Italian fishing practices, evaluate their sustainability, identify legitimate practices, improve cooperation between relevant sectors, and generate value for all involved (MSC, 2024a).

Expert Awareness of the MSC Pathway to Sustainability Program

All interviewed experts were aware of the MSC as an organization. However, the awareness of the MSC PSP was notably lower. Only Expert 9 expressed that she was familiar with the MSC PSP and was convinced of their facilitated capacity of participatory processes. Notably, seven experts **(1, 4, 10, 11, 13, 14, 16)** emphasized the MSC's association with LSFs. For instance, Expert 4 mentioned that a certification was needed for fisheries with large landings to enter a large market. This is atypical of SSFs, as their landed volumes are relatively low. However, certification is explicitly not addressed by the MSC PSP. After the MSC PSP principles were explained, a more positive response was generally received than if experts were asked to respond to the MSC's general applicability. For example, Expert 4 also became more optimistic about the MSC PSP as the interview continued, and more explanation was provided, noting that it could be a good initiative if the program worked.

7.2 ABALOBI

7.2.1 Introduction of ABALOBI

The ABALOBI initiative is an information-management system and mobile application suite intended to aid the recognition of the traditional rights of fishers by facilitating access to and control over information (Castillo et al., 2015; FAO, 2018). According to ABALOBI (n.d.-b), it is a social enterprise that empowers small-scale fishing communities by developing fisher-driven technologies. This is based on a traceability platform and a marketplace, allowing the digital sales of fish products and facilitating delivery to local households and businesses (ABALOBI, n.d.-b). ABALOBI provides free interconnected mobile apps to improve monitoring, traceability, and transparency of data reflecting SSF behavior (Castillo et al., 2015). With the ABALOBI Fisher app, fishers can register catch data, keep track of revenues and expenses, access accurate weather forecasts and navigational support, and digitally store fisheries documents (ABALOBI, n.d.-a; Castillo et al., 2015). Furthermore, it has

communication functionalities that allow fishers to chat with each other and to link logbook entries for collaborative management as part of local cooperatives (Castillo et al., 2015). The ABOLOBI initiative is not just information-driven but also non-state-market-based. The ABALOBI Marketplace app allows fishers to process and market their fish digitally (Castillo et al., 2015). If fishers choose to sell their fish on the Marketplace app, the catch is collected by ABALOBI and brought to specific facilities, where only ABALOBI fish is kept frozen. Once a sale via the Marketplace app occurs, the fish is delivered to the consumer's desired location (ABALOBI, 2022; SnapScan, 2020). Initially, the app only enabled fishers to process and market whole fish as "Catch Of The Day" (Fredericks, 2022). However, ABALOBI also agreed with some South African fishers to implement a tiered pricing structure for certain catch species to sell value-added products (ABALOBI, 2021; Fredericks, 2022). As a result, these products are also supplied to local cafeterias, food clubs, and supermarket chains (ABALOBI, 2021; Fish With A Story, 2024).

It is suggested that one of ABALOBI's strengths lies in providing fishers with information to prove their socio-ecological legitimacy (Castillo et al., 2015). More specifically, Castillo et al. (2015) suggest that many fishers have employed their data as supporting evidence in rights appeal processes with state authorities. The value of this proposition has become evident as fishers recognize that digitizing their activities can lead to heightened visibility and legitimacy in the eyes of state authorities (Castillo et al., 2015). Furthermore, it provides SSFs with a method to partake in decision-making processes and improve personal business development (Castillo et al., 2015). Indeed, this central role of information in their approach also indicates the non-state IG capacities that Mol (2006) discusses.

7.2.2 ABALOBI's Approach Toward SSFs

In this thesis, ABALOBI has been selected as an example of a potentially applicable non-state IG approach, as it also met all the selection criteria mentioned in *Section 3.2*. Because it started in South Africa, and most fishers (1285) are registered there (ABALOBI, n.d.-c), literature broadly refers to South African cases.

ABALOBI's Italian Efforts

ABALOBI is a South African-based organization founded in 2015 and now has an international reach. Currently, there are twelve Italian fishers registered. ABALOBI is committed to developing the platform for use in community-supported SSFs globally (Bennett et al., 2020). The WWF utilized the tool in Italy, which led to a partnership in multiple Mediterranean locations, including the Gulf of Patti, adjacent to Sicily (ABALOBI, 2021). According to one of the local fishers, direct sales through the ABALOBI Marketplace app could lead to an increase of 50% in the earnings of fishers (WWF, 2022). This estimation does not seem farfetched when considering calculations of ABALOBI on the economic impact in South Africa. According to ABOLOBI (2021), the increase in revenue per fisher for every USD of funding spent was 36% in 2019 and is aimed to be over 1800% by 2023. They also stated that fishers using the ABALOBI Marketplace earn around four times more per month than before using the tool (ABALOBI, 2021). In Italy, the WWF also provides support in gaining access to EU funds with the necessary logistics to facilitate sales and deliveries through this app (WWF, 2022).

Expert Awareness of ABALOBI

When prompted, eight experts **(1, 2, 4, 9, 10, 11, 13, 14)** shared that they were aware of ABALOBI, while six experts **(3, 5, 6, 7, 8, 12)** shared that they were unaware of ABALOBI. Indeed, not all experts answered this question effectively due to time constraints in some of the interviews and poor translation of written answers to interview questions. Six experts **(2, 4, 5, 6, 8, 16)** shared that they knew similar tools to ABALOBI. Experts 2 and 4 also addressed that ABALOBI was used as a concept to pilot a Virtual Market application (VirMA) in collaboration between AMAP, CNR IRBM, and other research

institutes, which they deemed to be better suited to meet the specific needs of Italian SSFs than ABALOBI (Bolognini et al., 2023).

7.3 Capacity of Non-state IG to Facilitate Contextualization and Co-management

The previous two sections provide some theoretical considerations of the capacity of non-state IG based on literature regarding the MSC and ABALOBI. This section will bring forth these facilitative capacities more concretely by discussing literature and considering the attitudes of interviewed experts. *Sections 7.3.1 and 7.3.2* will discuss whether non-state IG is considered to have a facilitative capacity to aid the contextualization of regulations and co-management of Italian SSFs. Next to this, *Sections 7.3.3 until 7.3.5* address other expert-identified facilitative capacities of non-state IG that could, directly and indirectly, serve these same theoretical objectives. *Section 7.3.6* discusses some other expert-identified non-state approaches with capacity for IG.

7.3.1 Contextualization of Regulations through Non-state IG

Twelve experts **(1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13)** responded positively when asked if non-state approaches can aid the facilitation of more contextualized regulations. Notably, much of their responses on how they could aid the contextualization were elaborated on by discussing their general facilitative capacities discussed in *Sections 7.3.3 to 7.3.6* and how they related to this ambition.

For instance, Expert 9 noted that non-state approaches always have the role of counter-balancing authoritative powers with ineffective recognition of SSF characteristics and bringing attention to issues that fishers face. This also followed expert-identified facilitative capacities in representing Italian SSFs, as discussed in *Section 7.3.*5. Two experts (**5, 6**) also noted that when fishers are more involved in providing information, more information is also available to gain an in-depth understanding of the complexity of the Italian SSF industry. Indeed, in *Section 7.3.3,* the facilitative capacities of non-state IG in aiding data collection processes are discussed. However, as is also apparent in *Section 7.4.2*, validating this novel data can cause challenges.

Expert 4 was aware of local non-state initiatives that can aid the specific recognition of the quality of SSF products but did not see the same on a national level that could aid with this. Expert 2 mentioned that non-state approaches sometimes aid the definition of data collection schemes locally and address problems and opportunities. She suggested this could also help identify development trajectories to unlock the full SSF potential toward a sustainable blue economy. Furthermore, she noted that this knowledge would aid in identifying which specific financial measures should be supported and which challenges each region faces. According to Expert 11, the current CEG system cannot reach everything and everywhere or be fully informed without the involvement of non-state approaches. Furthermore, he noted that, in some cases, there are unpredictable effects of regulations that fishers and non-state approaches could more easily predict. Two experts **(3, 13)** believe that non-state approaches are more long-term than the CEG system. As suggested by Expert 3, non-state approaches can be engaged in contextualizing regulations, especially in the involvement of precise ideas and strategies. According to him, there was a need for collaboration between state and non-state to build a network to reach the desired objectives. He also noted that, without this collaboration, there would be a risk of producing short-term results.

Contextualization through the MSC Program

Seven experts shared that the MSC can aid the contextualization of Italian SSF regulations **(1, 7, 8, 9, 11, 12, 14).** As the MSC program receives widespread consumer and stakeholder recognition, it stands to reason that any MSC-engaged SSF can inherently also expect more legitimacy (Duque, personal communication, July 28, 2023). Expert 9 also agreed with this notion and suggested that a fishery engaged with the MSC program shows a level of engagement and management that could be

perceived differently from any ordinary fishery. Furthermore, Duque (personal communication, July 28, 2023) has noted that SSFs can be supported to perform stock assessments through the MSC's OSF. Such support was also provided to Sardinian octopus fisheries engaged with the MSC program. This was followed up with discussions with state authorities in attempts to prove that bigger landing sizes than the current legal minimum sizes can also be considered legitimate from a biological perspective (Duque, personal communication, July 28, 2023). Indeed, this directly relates to the challenge related to sub-national differences in governance subjecting Italian SSFs targeting octopus fisheries discussed in *Case 1 in Section 5.3*. This demonstrates that the MSC can aid the contextualization of regulations by supporting SSFs in substantiating claims of legitimate practices when legal disparities are faced. Furthermore, it can ensure that regulations can be considered equitably fair compared to other Mediterranean and Italian regulations.

Three experts **(8, 11, 14)** suggested that the MSC can aid the structured progress to prove sustainable practices. Expert 8 suggested that the MSC can support organizations, like FEDERPESCA, to follow the path toward sustainability. Expert 11 expressed that the MSC's value is putting an SSF within a path that allows it to assess its status according to criteria and indicators—in effect, also allowing a form of self-reflection and a better understanding of what is needed to achieve sustainability goals. Duque (personal communication, 28 July 2023) also noted that, in some instances, SSF might already be sustainable and that the MSC Standard then primarily provides a structure to organize themselves better and continue their activities.

There have also been examples of the MSC program aiding fisheries in re-gaining social acceptability. For instance, a fishery targeting toothfish (*Dissostichus spp.*) in South Georgia could prove, through an MSC certification, that the fish they caught and sold did not fall into the category of toothfish fisheries that utilized IUU practices, under scrutiny of consumer-awareness campaigns against such practices (Longo et al., 2021). Indeed, they benefited from a social license to operate and associated socio-economic benefits (Arton et al., 2020). An MSC certification would also provide SSFs with credible proof that if there were any issues in them not meeting one of the MSC Principles, steps are still taken to arrive at these scientifically proven best practice levels. This credibility also follows from the independent audits associated with these processes (Longo et al., 2021). Although MSC-engaged fisheries are often not prone to perform multiple and unacceptable IUU behaviors, the MSC documentation also provides thorough documentation on well-defined issues. In turn, such documentation can indicate the activities that similar SSFs in the same location can take to progress toward legal, reported, and regulated management of their practices (Longo et al., 2021). These documents can voluntarily be obtained through the MSC capacity building program (MSC, 2024f) and used by SSFs to assess their progress, or they can follow from audits by independent auditors (Longo et al., 2021). Indeed, the independence of these assessments will likely also favor the credibility of other stakeholders' perceptions of these documents.

Contextualization through ABALOBI

Seven experts **(2, 5, 6, 8, 11, 13, 16)** responded positively when asked if ABALOBI can aid the contextualization of regulations. Expert 8 suggested that scientific institutes could use the additional data gathered through the use of ABALOBI and that the data on SSF activities would especially be crucial to understanding the state of the seas. Expert 11 also suggested that it could serve as a tool for collecting and sharing information collectively to support governance objectives. As also follows the research of Kruk et al. (2021), non-state approaches like ABALOBI can provide SSFs with information such as market intelligence and environmental data derived from self-reporting. Through this, SSFs can embrace an open normative approach and offer information that smallholders or other stakeholders can utilize to determine their objectives. As also follows from Kruk et al. (2021),

although ABALOBI is constructed using predetermined socio-ecological parameters, the information is generated, entered, and owned by fishers, granting them a level of influence over their portrayal.

Furthermore, Potts et al. (2021) suggest that data collected through the ABALOBI app also allows for better visibility of SSFs for parties involved in governance processes. Expert 4 specifically related this to governance on a local scale, with the additional suggestion that it could serve the management of MPAs or sensitive species. Indeed, as also follows from the FAO (2018), tools like ABALOBI can present an opportunity to leverage local fishing knowledge and aid the sharing of information about new species' sightings or habitat loss. This could also help in *Cases 3 and 4 in Section 5.3* by providing support on information surrounding the distribution of species protected by ACCOBAMS and covered by ICCAT regulations. Still, it is unclear how such additional information would be utilized. On the one hand, it might favor them due to recognition of the threatening combination of such regulations with high interactions between ETP species and Italian SSFs, resulting in more considerate measures of the challenges in adherence. On the other hand, it might increase the level of data on challenging conservation situations that can ultimately increase regulatory pressures.

According to Expert 2, ABALOBI can also aid the storytelling of fishers and bring them together, which is necessary for the contextualization of regulations. Expert 13 also noted that ABALOBI was especially valuable as it allowed for the co-development of technology with fishers to present the value of their activities. Still, three experts **(1, 7, 14)** also responded negatively when asked if ABALOBI can aid the contextualization of regulations. Expert 1 noted that such tools are not a good fit for every SSF, thus providing a limitation for a large-scale solution. Expert 7 emphasized the importance of reporting data through the DCF as part of national obligations and the significance of following established rules and regulations at the national level. She also expressed skepticism about a private platform completely substituting a governmental institution, as protecting everyone's interests should be safeguarded. Still, it should be noted that the researcher never prompted a response to a complete theoretical substitution of governmental activities through non-state IG. This seems to indicate that some experts might not directly consider the option of an information system responding to both CEG and non-state IG approaches but initially consider that only state or non-state IG approaches could be applied.

7.3.2 Co-management through Non-state IG

Twelve experts **(2, 3, 4, 5, 6, 7, 9, 10, 12, 11, 13, 14)** responded positively when asked if non-state approaches can aid co-management. Expert 9 suggested that fishers must take more responsibility in managing and understanding the issues caused by their activities and engaging more with the science behind them. She suggested that non-state approaches have a potential role in aiding this process, as they could aid them in providing information related to their activities and on relevant governance steps necessary to facilitate co-management. Still, she also addressed that this facilitative capacity can vary considerably per non-state approach. Expert 4 also perceived non-state approaches as aiding the facilitation of co-management but noted that research or academia should be involved in this process to see if the management is following criteria concerning the impact on resources and the environment. Indeed, this consideration of validation also aligns with what Song et al. (2020) suggest, as it indicates that the necessary validation of novel information flows before non-state IG could aid the facilitation of co-management. This notion also followed more broadly from the interviews when non-state IG was discussed, as is elaborated on in *Section 7.4.2*.

Co-management through the MSC Program

Five experts responded positively when asked if the MSC can aid co-management facilitation **(1, 8, 9, 10, 14)**. The explored literature does not provide explicit reasoning on how the MSC could aid the

facilitation of co-management of Italian SSFs. However, fisheries with LMPs are more likely to pass national and sub-national validation if they align with governmental conservation objectives. As this is also aligned with what a fishery is assessed against with Principle 3 of the MSC Fisheries Standard, it stands to reason that fisheries that are engaged with the MSC Program are also better equipped to have LMPs approved by state authorities (Duque, personal communication, July 28, 2023). This also followed the reasoning of Expert 9, as she suggested that complying with the conditions of the MSC Standard can facilitate the necessary groundwork needed for co-management. Expert 13 suggested that collecting data and involving stakeholders and SSF operators when engaging with the MSC program could also benefit co-management.

When SSFs participate in co-management, it also aids in the efficiency of the MSC's activities (Duque, personal communication, July 28, 2023). Contact with representatives of FLAGs is more fruitful, as it saves time and resources to be in contact with just one person instead of a group. Furthermore, they can aid communication, preventing misunderstandings and increasing the likelihood of reaching a consensus (Duque, personal communication, July 28, 2023). Still, LMPs can be used as a basis for audits when considering performance against Principle 3 of the Fisheries Standard if they are endorsed by the state (Duque, personal communication, July 28, 2023). More specifically, Principle 3 considers "legal or customary frameworks", with "accepted practices". Various stakeholders can participate in these frameworks, including producer organizations and indigenous groups (Longo et al., 2021).

Co-management through ABALOBI

Five experts **(4, 8, 10, 11, 13)** suggested that ABALOBI can aid the facilitation of co-management. Expert 13 perceived that information gathered with this tool could perhaps, anonymously, be provided as a source for any co-management committee. Expert 11 suggested that ABALOBI might have more facilitative capacity to facilitate co-management than for the contextualization of regulations. In fact, ABALOBI is considered a co-management tool (FAO, 2018; Petrik & Raemakers, 2018; Piazza & Raemaekers, 2017; Potts et al., 2021), and already receives support from WWF in Italy, which perceives it as supporting plans of increasing co-creation and co-management of Italian SSFs.

Much of the facilitative capacity of ABALOBI has also been deemed to follow from their capacity to adapt to local needs (ABALOBI, 2021). Furthermore, due to ABALOBI's improved accessibility to validated data and applicable rules and regulations, stakeholders are empowered during negotiation processes related to co-management partnerships. ABALOBI provides a platform for monitoring fishing practices and local collaboration with shared agreements pertaining to these practices and the following commercialization (Castillo et al., 2015). The increased access to information has also been reasoned to allow for opportunities to connect separated actors within or outside the fishing community (Petrik & Raemakers, 2018). As stated by the (FAO, 2018), enhanced access to and sharing of fishing data and information on regulations through social media internet-based applications can empower actors during negotiation processes of co-management schemes. Likewise, with the **ABALOBI Manager** app, commitments to each other can be monitored. The fact that the Fisher app also allows fishers to communicate through an online chat could also aid daily activities. Castillo et al. (2015) suggest that using pictures and comments in these chats increases when fishers become more confident in their vocational and technical capacity. All caught and landed fish registered on the ABALOBI Fisher app are verified by an ABALOBI Community manager at the moment of landing with the **ABALOBI Monitor app** (ABALOBI, 2022; SnapScan, 2020). In turn, this app allows for data capture and analysis of a wide range of fishing data in a community. It can include a register of fishers, vessels, and cooperatives, which can also be accessed by state authorities and co-management committee members (Petrik & Raemakers, 2018).

7.3.3 Data Collection through Non-state IG

The state-led information system's data collection processes were also addressed with expected informational challenges affecting their reform. Again, five experts **(1, 2, 9, 10, 11)** suggested that non-state approaches can aid the state-led information system through their data collection processes. According to Expert 9, these approaches can also play a key role in data collection processes and capturing local ecological knowledge of fishers and the knowledge of stakeholders. Expert 1 also noted that non-state approaches can aid data collection but will not be considered a basis for politics in the current CEG system. As such, he stressed the necessity of working with scientific institutions to help these processes. Expert 11 also mentioned the strong potential of these approaches in data collection processes while addressing the necessity of validating this data. This challenge is discussed further in *Section 7.4.2*.

Data Collection through the MSC Program

Three experts **(10, 11, 14)** suggested that the MSC can aid data collection. For instance, Expert 10 noted that they can provide an essential alternative to data collection processes in the CEG information system. He commended the data collection processes and the large amount of collected and requested data. Indeed, this follows much of the MSC's characteristic portrayal of IG principles, as discussed in *Section 7.1.1*.

As also follows from Longo et al. (2021), most of the progress in enhanced governance and data collection would occur in the phase leading up to certification. MSC-supported FIPs have resulted in IUU-mitigating measures, with examples of actively monitored IUU levels, engagement with compliance authorities, and implementation of MCS technologies. In some cases, VMS and improved expertise of observers on fishery-specific vessels were implemented (Longo et al., 2021). The MSC also recognized that a data-limited fishery is not, per definition, an unsustainable one, with applied precautionary management measures and created a Risk-Based Framework (RBF), which is used in audits as a framework that relies on any data that the fishery can provide and what is collected in a workshop (MSC, 2024e). Auditors then perform specific analyses (for instance, a "consequence analysis" intended to assess trends in the status of data-limited targeted populations). The results of these analyses are then put against the default assessment criteria. Still, this method is more likely to result in lower scores than if the fishery did have data (MSC, 2024e). This RBF supports the advice of Song et al. (2020), allowing proof of legitimate practices with data limitations. It also accounts for data limitations that Song et al. (2020) have noted as potential challenges, namely those resulting from informal and customary trading relations or higher costs associated with informational provision. Expert 11 also reported that engaging with the MSC program is already beneficial for SSFs, as they must document everything related to their ecological status. Still, he (and other experts) noted the challenges of recognizing this data in the DCF, as discussed in *Section 7.4.2*.

Expert 8 also noted that the MSC's international experience could provide knowledge and insights into assessing the status of exploited species and that the MSC is well-equipped to provide valuable advice to the CEG system on multiple scales of governance. Nonetheless, maintaining the MSC's credibility in the multi-level governance of Italian SSFs would also require strong market demand and sufficient state support and assurance (Bush et al., 2017). Thus, the relationship between stakeholder support for the MSC program and the capacity to aid constructive and equitable inclusion of Italian SSFs in governance processes to reduce IUU practices is reinforcing, as state support will increase with more credible successes. This also follows from Song et al. (2020), who suggest that stakeholders must consider a system responsible for collecting data and information legitimate and credible. Still, as further discussed in *Sections 7.4.2 and 7.4.3*, the MSC must overcome considerable informational challenges in data validation and stakeholder critique before ensuring this.

Each Principle of the MSC Fisheries Standard has also been suggested to motivate data collection processes (Longo et al., 2021). **Principle 1** requires gathering information on illegal catch estimates of the exploited stock, which resulted in fishery managers providing transparent documentation and justification of estimates. Associated action plans often also explicitly require producer associations to collaborate with other institutions to come to these estimates, sometimes even extending across jurisdictional powers (Longo et al., 2021). **Principle 2** also demands that all incidental, targeted, retained, or discarded bycatch be considered in assessments concerning ETP species. This has also improved instances of reported intentional or incidental catches from sharks to marine mammals (Longo et al., 2021). This would also indicate usefulness in situations described in *Cases 3 and 4 in Section 5.3*, where Italian SSFs faced considerable existential threats due to their high interaction with ETP (elasmobranch and cetacean) species. Indeed, this facilitative capacity has also been discussed due to the applicability of ABALOBI in this regard. Thus, the question addressed in *Section 7.3.1*, whether such additional information would favor Italian SSFs or increase regulatory pressure, also follows here. Lastly, conditions of **Principle 3** have resulted in improved MCS systems, such as installed satellite tracking on all vessels that were part of a certificate and improved state patrols in monitoring efforts (Longo et al., 2021). Still, Regulation (EU) 2023/2842 (2023) will also facilitate this through a more authoritative CEG process.

The CoC Standard also allows for a mechanism to fully document all activities within a cohesive network on top of the regulations that mandate the documentation of fishing activities (Longo et al., 2021). The resulting information can also be helpful to prove the legitimacy of fishing activities. For instance, one of the critical issues of IUU catch entering the market is the need for effective MCS measures at landing ports (Longo et al., 2021). This has also been defined as one of the critical challenges of Mediterranean IUU governance (Cardinale et al., 2017; Cashion et al., 2019; European Commission, 2022a). The MSC program has approached such challenges in areas historically associated with high vulnerabilities to IUU incidents, such as in the Far East of Russia. Here, they were able to promote the sustainability of a fishery by auditing a fishery and the first buyers with CoC certificates. Additionally, the fishery could not land their catch in certain landing ports where documentation was cross-checked (Longo et al., 2021).

Two experts **(9,14)** also noted that the MSC could experience challenges due to the intrinsic characteristics of Italian SSFs. According to Expert 9, there is much data asked of fishers, and it can be an intensive and challenging process to realize this in the context of Italian multi-species SSFs. She noted that it might be easier to engage with mono-species fisheries as there were fewer variables to control. As such, she believed that the MSC's success in Italy would be highly species -and site-specific. She noted that these characteristics would challenge all certification schemes to establish themselves. Notably, this informational challenge was also addressed as one that the current state-led multi-level information system faces, as discussed in *Section 6.1.1*.

Data Collection through ABALOBI

Eight experts **(4, 7, 8, 9, 10, 11, 13, 16)** suggested that ABALOBI can aid the data collection processes. Experts 9 and 13 both noted that, due to the lack of data in the Italian SSF industry, anything that can be done to improve data collection processes should be utilized. Likewise, Expert 9 suggested that the challenging intrinsic characteristics of the Italian SSF and the poor infrastructure to control all landing sites require self-reporting tools in some cases. Indeed, in CEG and non-state IG, a solution would need to be found to overcome this challenge, as the state-led information system, MSC, and ABALOBI have all been suggested to be affected by this.

Furthermore, Expert 9 noted that it would be ideal to have electronic logbooks where each fisher would log all their information, especially if it were centralized. She also stated that ABALOBI could

allow for this to take place at relatively low costs and that it could engage fishers in data collection processes in a user-friendly way. Petrik & Raemakers (2018) also suggested that ABALOBI can aid the industry as there is a demand for comprehending data on a broad geographic scale and integrating diverse knowledge and data sets. In this process, ABALOBI can also reduce controllers' need to travel to remote locations for data collection due to the fishers' capacity to gather data with minimal training. This data can be cross-verified against the information collected by ABALOBI data monitors and managers (Petrik & Raemakers, 2018). Considering the high costs and effort that the EFCA currently must invest in controlling Italian SSFs (see *Section 4.1*), this seems like it could have considerable value in the context of Italian SSF governance.

According to Expert 8, ABALOBI could also support SSFs in meeting the new pulling demands following Regulation (EU) 2023/2842 (2023). She suggested that ensuring SSF vessels can gather precise data in logbooks and AIS uses could be fundamental. She noted that Regulation (EU) 2023/2842 (2023) demands what EU member states must provide and that it is up to Italy to decide how they could meet those demands. Hence, ABALOBI could offer a simplified manner and a model for keeping track of data now and in the future when it becomes obligatory. Expert 13 also shared this positive conviction in line with the upcoming EU control regulation. As she suggested, SSFs will need to have a system to report on their catches anyway, and this is an app that provides a usable interface for fishers. She only noted the challenge of ensuring it can be linked with an official information system. Still, Expert 4 also said that he was uncertain about the necessity for additional data streams parallel to the ones of the DCF.

According to Expert 13, improved data collection processes and awareness of the importance of collecting data by fishers would also empower them. As she suggested, fishers must be empowered to have their own data, provide information, and visualize SSFs in spatial matters as they are often invisible. The logged captures also provide fishers with proof of their involvement in fishing activities, which has been vital in obtaining fishery rights and receiving recognition as fishers and business owners (Petrik & Raemakers, 2018). As such, the ABALOBI can also play a role in the contextualization of regulations, just like MSC has been reasoned to be actively doing in the case of Sardinian octopus regulations (see *Section 7.3.1*).

7.3.4 Strengthened Market Power through Non-state IG

Four experts **(2, 4, 10, 13)** suggested that non-state can aid the market power of Italian SSFs. For instance, Expert 2 noted that there is often a challenge for Italian SSFs to reach more access in the market with their products. According to Di Cintio et al. (2022), benefits can be found in more direct sales to customers for higher prices, especially with low-value fish, which are often disregarded by shops (Di Cintio et al., 2022). Still, they noted that these investments require more time and effort from fishers and suitable infrastructures that are often not in place. Indeed, as discussed in *Sections 5.1 and 5.2.1*, SSFs often sell their catch directly to consumers, limiting the traceability of these products. It was also suggested that non-state approaches can aid such sales by facilitating a more direct connection between consumers and fishers and that they can ensure better traceability **(2, 10)**. This would suggest that non-state IG could provide a direct solution for the market threats discussed in *Section 5.2.1*. Penca et al. (2021) agreed that solutions can be found in shorter value chains. They also suggest innovations in the distribution channel, the diversion of product types and promotion, education on the particularities and benefits of SSF products, label, and brand creation, and co-management with improved leadership. The RPOA-SSF has also recognized the need for improved SSF value chains, focusing on enhanced profitability and viability by seeking non-state approaches that could play a role in market enhancement, product quality, and traceability (Penca et al., 2021).

Strengthened Market Power through the MSC Program

Five experts **(5, 6, 8, 11, 14)** also suggested that the MSC can aid the market power of Italian SSFs. As already presented in *Section 7.3.1*, support for the MSC in aiding contextualization of regulation could aid in larger landing sizes of Sardinian octopus. This would likely also allow for higher sales prices. Expert 14 also suggested that the MSC could support reaching new markets. Expert 2 also suggested that the MSC is providing support in Puglia to increase the recognition of "white shrimp". Furthermore, Expert 11 suggested that the MSC can facilitate more customer demand regarding sustainability. As such, it might also allow for a better recognition of the favorable ecological characteristics of Italian SSFs engaged with the program. On the contrary, five experts **(4, 5, 6, 10, 13)** also suggested that the MSC cannot aid in market power. Most addressed the lack of capability to certify Italian SSFs, for instance, due to low landing volumes and different pursued markets. Two experts **(4, 13)** also suggested that the fact that the MSC does not distinguish between SSF and LSF products limits the likelihood of SSFs engaging with the MSC program. According to Expert 4, they need something that will increase the value of their product, especially for species that they catch together with LSFs. He emphasized that it would be necessary for these products to present their more beneficial ecological background. However, he also addressed that they usually do not sell the fish in the official market. Expert 13 also suggested the need to distinguish this catch from each other, but the MSC does not promote this difference in the market.

Strengthened Market Power through ABALOBI

Notably, ABALOBI is exclusively focused on facilitating the sales of SSF products. According to ABALOBI, all fish sold on the Marketplace app are traceable due to their technology (Fredericks, 2022). The ABALOBI Manager app includes updates on the latest fishing regulations and notices. ABALOBI also serves members in the post-harvest supply chain with the **ABALOBI Co-op app** so that they can account for their work and expenses (Petrik & Raemakers, 2018). This is facilitated by allowing inventory tracking and the logging of post-harvest contributions. This allows for the traceability of practices that might otherwise be overlooked and left without compensation (Castillo et al., 2015). Indeed, as discussed in *Section 5.2*, ¸Italian SSFs share a general characteristic in their lack of market bargaining power and traceability of products in the market. Thus, it stands to reason that tracking market activities in the ABALOBI app might also allow for additional proof regarding revenue streams and power imbalances in market structures. As such, this might also be used to reduce these power imbalances through implemented regulations that better consider these socio-economic challenges. Furthermore, it seems likely that this data could also be considered in the contextualization of regulations, as it might indicate their vulnerability to change.

More specifically, eight experts **(2, 4, 5, 6, 7, 9, 11, 13)** also suggested that ABALOBI can aid the market power of Italian SSFs. Expert 13 emphasized the potential of ABALOBI in aiding marketing activities and improving sales. Experts 5 and 6 noted that ABALOBI could aid fishers in aggregating their catch and selling larger quantities more easily. Expert 11 also noted the potential value of the tool facilitating direct sales from fishers to customers but emphasized the necessity for the right environment to let it happen. Kruk et al. (2021) also noted that ABALOBI creates a supportive environment to empower fishers through information and enhance their ability to manage external Risks like disease and payments. Furthermore, they suggested that it also enables SSFs to share data on their products while retaining ownership of a digital marketplace. As such, it also enhances the position of SSFs in value chains by providing a two-directional information exchange, either among fishers or between fishers and other stakeholders. Raemaekers (2020) also suggested that it could aid in establishing solid connections with retailers, allowing fishers to secure improved prices and delve into traceability systems. Still, Expert 2 also suggested that the market can directly impede the application of ABALOBI. She mentioned that the success in South Africa resulted from urgency and

the absence of market infrastructure and institutional framework, which is less of an issue in Italy. Furthermore, presenting this as an alternative to what fishers are already familiar with could pose a considerable challenge, according to her. They might sometimes be content with their current monthly earnings, preferring to avoid investing time in mastering a new tool.

Kruk et al. (2021) also noted that ABALOBI already succeeded in facilitating South African SSFs in making decisions regarding where and to whom they sell their catch by providing market intelligence, such as prices and potential buyers. Likewise, the catch and effort data that fishers can share with the digital marketplace was also considered to empower state authorities and market participants to access information about the fishery's source, practices, and status without imposing pre-interpreted sustainability thresholds or scores.

7.3.5 Representation of Italian SSFs through Non-state IG

As discussed in *Section 6.3.2*, the current representation of Italian SSFs desires improvement. Four experts **(2, 8, 9, 13)** suggested that non-state IG can aid the representation of Italian SSFs. According to Expert 9, they can amplify the voices of fishers and pressure administrations to drive a policy or attention to certain issues that result from ineffective governance that does not effectively recognize SSF characteristics, as well as ensure that those issues are being addressed. Indeed, Expert 13 also suggested that non-state approaches provide the voice of civil society and the environment, which should be part of the governance discussions. Seven experts **(1, 2, 5, 6, 9, 10, 13)** also explicitly mentioned that non-state IG can aid mediation between SSFs and other actors. According to Expert 9, they often have more capacity to work directly with local stakeholders. Expert 2 also noted that non-state IG could aid in the process of innovation brokering by addressing difficulties experienced in a sector and addressing them by putting researchers in contact with operators. As such, these capacities for representation and mediation will likely also allow for better contextualization of regulations, as well as benefit the recognition of the value of co-management by state authorities and subsequent endorsement of these schemes.

Representation through the MSC Program

Three experts **(8, 9, 14)** mentioned that the MSC can aid representation. For instance, Duque (personal communication, 28 July 2023) suggested that while the MSC is not a lobbying organization, it still pushes for better recognition of local circumstances of fisheries. For instance, through socio-economic models (including fuel price, product price, etc.) that were developed between the MSC and a research institute to contextualize regulations surrounding an LSF targeting deep-sea pink shrimp (*P. longirostris*) in the Adriatic Sea, which were shared with the GFCM, with possible adoption in future management plans. While this example reflected the support given to the contextualization of LSF regulations, it also presented the forms of support that the MSC could provide in the contextualization of SSF regulations. Furthermore, Expert 8 expressed that the MSC can work with institutions, like FEDERPESCA, to bring ideas and support to those closer to state authorities. In this regard, she considered that the MSC also provides a way to represent organizations. Expert 9 also noted that the MSC can facilitate more stakeholder engagement and participatory processes. Certification is also suggested to enhance cooperation with decision-makers, giving fishers a stronger voice in governance processes (Arton et al., 2020).

Representation through ABALOBI

Notably, no experts explicitly addressed ABALOBI's capacity for representation. Still, according to Petrik & Raemakers (2018), this is especially valuable as fishers often lack direct connections with decision-makers and representation in governance processes. ABALOBI could aid in establishing real-time connections among stakeholders who may be distant from each other. As they also suggest, this

could also aid decision-makers by integrating fishers and aligning consultatively on strategic objectives and regulatory processes. It could be considered that experts were unaware of these capacities, as half of the experts were unaware of ABALOBI. However, as experts did not explicitly discuss the applicability of ABALOBI to provide representation in the context of Italian SSFs, it cannot be considered with much credibility in efforts to contextualize regulations and co-management.

7.3.6 Complementary Non-state IG Approaches

While the MSC and ABALOBI have been selected in this thesis as examples of non-state IG, other non-state approaches that rely on principles of IG were also shared by experts as possible approaches to improve the recognition of Italian SSFs. For instance, two experts **(2, 10)** noted that other certification programs could also play a role in the socio-ecological recognition of Italian SSFs. According to Expert 2, the efforts of AdriSmArtFish could be considered as a lighter version of the MSC, as it tried to put together criteria on current regulations (e.g., on mesh sizes, etc.) to come to a protocol of fishing that could serve as a basis for a European label of sustainable SSF practices. This certification aimed to stimulate the delivery of certified products that presented the added value of products caught by SSFs. Expert 4 also mentioned that Slow Food can aid the socio-ecological recognition of Italian SSFs by exemplifying that they provided mussels caught in Ancona with a label. This label ensured that the mussels were sold for three times the price of those caught 5km further away. The Global Fishing Watch was also suggested to have a potential role in recognizing Italian SSFs due to their advanced satellite images of fishing activities **(14)**.

Indeed, this demonstrates the likelihood that more non-state IG approaches could aid the facilitation of contextualized regulations and co-management of Italian SSFs. Two experts **(11, 14)** also suggested that ABALOBI and MSC can complement each other's activities. Indeed, it has already become apparent that ABALOBI might have more capacity to facilitate SSF products' traceability in a somewhat invisible market structure. At the same time, MSC seems to be considered more credible and provides a framework for sustainable progress and reaching market channels. It seems likely to reason that activities can be reasoned within these capacities that can result in collaborations between the two non-state IG approaches. Still, Expert 11 also noted that the proper environment is needed for this to happen, which is also addressed in *Section 7.4.1*.

Given the multiple non-state approaches and their different and yet-to-be-identified capacities, it seems likely that this notion of complementary efforts also applies to other combinations of non-state IG approaches. Still, Expert 2 also noted that only a few tools must be supported, as too many options create confusing situations for potential users. This raises the question of how the information system could maintain the balance when multiple non-state IG approaches could be considered credible through validation.

7.4 Informational Challenges in Non-state IG Reform of the Information System

This section starts with informational challenges that experts addressed as being present in both the general application of non-state approaches and the application of the MSC and ABALOBI. As the section continues, informational challenges become more specific and related to only one of the selected non-state approaches.

7.4.1 Multi-level Differences and General Applicability

Much in line with the informational challenge of the multi-level approach applied in CEG, as discussed in *Section 6.4*, seven experts **(1, 4, 7, 9, 11, 14, 16)** suggested that implementing solutions with a general (i.e., national or international) effectiveness would be challenging.

The Challenge of General Applicability

As suggested by Expert 9, the applicability of every non-state approach must be assessed on a case-by-case basis, and setting a policy to endorse an approach can be especially challenging, as the situation can vary considerably from one place to another. Expert 7 shared this notion and added that the success of such approaches would depend on the state of the fisheries, with potentially more straightforward implementation for those in good shape. She also advised caution in choosing areas for implementation, focusing on regions where the approaches could contribute without significant risks and with sufficient collaboration. Furthermore, she stressed the absence of a one-size-fits-all solution and the need for state authorities to consider the different needs of the current organizations in the CEG system.

Five experts **(2, 4, 9, 11, 16)** specifically suggested that the success of ABALOBI will be area dependent. Expert 4 also noted that it would likely have the most effect on a local scale, where it could be a good option. Still, the applicability on a national level would be impossible, mainly due to the low collective capacity on a national scale (as discussed further in *Section 8.1).* Castillo et al. (2015) also suggested that expanding the work of ABALOBI is simpler within a limited geographical area than extending it into diverse socio-cultural regions of South Africa and other foreign settings due to the highly contextualized nature of co-designing this infrastructure. Thus, they suggested the need for a participatory design process comparable to the one in South Africa with local fisher associations. According to them, this would ensure the accommodation of particular local requirements and user experiences and an attempt to cultivate a sense of local ownership. This would suggest that the uptake of ABALOBI should be specifically promoted toward CO.GE.PA, as they serve as the local fisher associations in Italian SSF governance.

Furthermore, three experts **(4, 8, 9)** suggested that local differences would limit the MSC's general application. According to Expert 8, the challenge and opportunity for the MSC would also be to get to know the local situation they are working in, as every area is different, and the effectiveness of the co-management approach will also vary depending on the location. So, there would be a lot of research and understanding needed before they can effectively assist with co-management. The investments in gathering knowledge of the local area will also ensure more acceptance of fishers. Expert 8 also considered it a considerable challenge for the MSC to ensure that it would be widely recognized as an organization that can facilitate co-management in multiple areas and locations.

Expert 9 also suggested that the success of the MSC should be considered on a case-by-case basis. She provided the example that management at a local level will be challenging when it concerns a specific local fishery that targets a shared stock. Still, Expert 4 noted that the MSC PSP could be more effective locally than a certification. According to Vindigni et al. (2016), future management approaches must be tailored to specific contexts, adapting to local circumstances and assessing the governability of Italian SSFs through processes that encourage interactive communication and learning. Furthermore, effective implementation requires strong collaboration between EU member states and multi-level administrations to ensure coordinated planning and sustainable SSF governance. This already indicates a challenge for the CEG system to come to general solutions, supporting the notion that non-state approaches would experience similar challenges.

Indications of the Value of Complementary Efforts

Notably, four experts **(4, 5, 6, 13)** also suggested that MSC certifications do not work locally. All these experts noted that most SSF products are sold locally, limiting the need for certifications, as certified products would be more suited to be sold nationally or internationally. This also relates to a lack of traceability in the markets, as discussed in *Section 5.2.1*. Still, as also followed from *Section 7.3.4*, non-state IG, in general, was deemed to provide the capacity to enhance traceability, too. Likewise,

as ABALOBI has been considered to work most effectively locally and they are primarily focused on direct sales to consumers, it might follow logically that ABALOBI can lay the groundwork for ensuring a traceably market infrastructure that can later be utilized when SSFs would like to engage with the MSC program. Promoting such a collaboration could also benefit ABALOBI as it might provide SSFs with additional motivation to use ABALOBI. These could also be considered as supporting notions for the complementary aspects of non-state IG approaches, as discussed in *Section 7.3.6*.

7.4.2 Data Validation of Information Flows

Indeed, much like Song et al. (2020) suggest, the validation of novel information flows stemming from non-state IG was considered an informational challenge by multiple experts **(1, 4, 6, 7, 8, 9, 10, 11, 13)**.

Data Validation of Non-state IG Approaches

According to Expert 4, everything should, over time, always be monitored by different approaches, including self-reporting. Still, he noted that self-reporting should follow a scientific methodology, sometimes with observers, that should be controlled by a scientific institute. Expert 1 also stated that while the private sector can be involved in governance processes, the multi-level CEG information system must always maintain the official level. Expert 10 suggested that non-state approaches already collect data and that challenges concerning data validity are already present within the CEG information system. As such, he suggested that data from non-state approaches should be thoroughly assessed to see if it is reliable and valuable without increasing the challenge that the state-led information system already faces.

Expert 11 also expressed that the validation of non-state IG data would be more complicated, as the DCF has its own statistical structure and approach, with assured independent processes. Still, he emphasized the potential of self-reporting, especially as it would allow data collection at a very high resolution that the CEG information system could not reach independently. However, he considered integrating this data into the DCF as especially challenging. He expressed the need to thoroughly assess and validate the data's legitimacy, credibility, and salience before the process could be formalized and endorsed. He suggested that the CEG information system would also have to share expertise on how non-state approaches can meet these criteria. Still, as follows from Bradley et al. (2019), it is not immediately likely that such support can be expected. They consider that data collected by SSFs are rarely synthesized and used by state-appointed research institutes without a clear mandate from state authorities to do so. This likelihood is further impeded, as they suggest that the collected data may not align with the standards of the state-led information system, creating institutional challenges in the utilization and uptake of novel data streams.

Validation of ABALOBI Data

Most expert reflections on data validations **(4, 8, 9, 10, 11, 13)** were explicitly related to the likelihood that ABALOBI could meet the data requirements of the state-led information system. Expert 9 noted that adoption by the national data collection systems would require infrastructure to collect the information and gather it. Furthermore, she expressed the need to validate the data, especially if it concerns a novel approach. She noted that different levels and types of data are collected and that the usability can differ per type. According to her, this validation might occur through, for instance, some cross-checking and cross-referencing data and random checks of on-site data collection. ABALOBI could facilitate this effectively, as it has a database management system that supports data-sharing permissions and allows for integration with other data systems and information flows (Castillo et al., 2015). Fishers would need to consent for data sharing in the ABALOBI Fisher app to be disclosed to external parties. However, state authorities can also view data from the ABALOBI Monitor app (Castillo et al., 2015). In general, Petrik & Raemakers (2018) promote the possibility of

ABALOBI increasing data availability and, in turn, enhancing the quality of information on which decision-making is based. According to ABALOBI, the system can also render conventional logbooks obsolete, which is generally time-consuming and often receives little feedback from the fishers (Raemaekers, 2020).

Expert 9 also considered that more local research institutes could validate this. CNR institutes may play a role in this, as they need to integrate the self-reported data into data they share with the national administrations. However, she also suggested that if the system works, it can be considered a valid approach after maybe a few years of validation. Expert 4 shared more skepticism in this regard, as she mentioned that data collected with ABALOBI would not follow the principles of statistical sampling that the DCF demands and which he deemed necessary to expand the universe of SSFs. Furthermore, he noted that while ABALOBI could provide more precise data, it could not be expanded to the universe of the vessels. He exemplified this by stating that it could allow data collection of several ships, which are collaborative for some reason, and they have the possibility of fish inside an MPA. The data collected from this specific situation could not be extrapolated to the situation of other Italian SSFs. As such, it could also not be integrated into the DCF. Expert 10 suggested that challenges of the DCF surrounding data-accessibility (as discussed in *Section 6.1.2*) should also be considered by ABALOBI, as such information should always be universally available, take little time to obtain, and present transparency to ensure the reliability can be evaluated. He also noted that the challenge concerns how data is collected and how to ensure that data is explicitly acquired and tailored to management needs.

This also followed from notions of five experts **(7, 8, 9, 11, 13)** that suggested that the state-led information system must give trust in the ABALOBI program. Expert 8 suggested that endorsement of MiPAAF was needed to endorse the application. Again, this supports what Bradley et al. (2019) suggest, as they noted this necessary improvement before actors in the information system would consider using this data. Expert 13 noted that DG MARE must also endorse this tool to ensure the provision of data through the DCF would be accepted.

Expert 7 also expressed skepticism about a private platform, such as ABALOBI, entirely substituting an institution in the CEG system in terms of protecting everyone's interests. She acknowledged that industries are free to choose private platforms for their business decisions but emphasized the need to consider the trustworthiness of such platforms, especially when money is involved. The skepticism regarding ABALOBI's utilization in the state-led information system was shared by Expert 16. She also noted that the state-led information system should be the only system maintaining the data collection processes that precede regulatory processes. Literature also suggests that fishery-dependent technologies that lack technical and performance standards for data collection and processing might not gain support from managers or be widely used in fisheries. The absence of clear data standards raises concerns about the legitimacy of app data due to self-reporting bias, possibly hindering the acceptance by managers (Bradley et al., 2019).

Validation of Data from the MSC Program

Notably, little attention was provided to data validation regarding the MSC's data. This might indicate that the MSC is considered to be more credible than ABALOBI and other non-state IG approaches. However, the likelihood remains that data stemming from MSC engagement must receive similar attention to that deemed necessary in the general validation of non-state IG data. This would likely be needed before it could be recognized by the multi-level information to facilitate contextualization of regulations and co-management of Italian SSFs.

7.4.3 Responding to Stakeholder Critique on Applied Methods

While no direct informational challenges were shared as expected regarding the validation of data stemming from SSFs' engagement with the MSC program, five experts **(5, 6, 9, 11, 12, 13, 16)** were considerably critical toward the MSC and their applied methodology. As mentioned, the MSC is no stranger to receiving critique (Bush et al., 2013; Foley, 2013; Hønneland, 2020; Nyiawung et al., 2021). Still, it might be that the MSC must invest considerable effort in overcoming this challenge due to the lesser awareness of the MSC PSP in an Italian context. As the MSC's applicability in facilitating contextualization of regulations and co-management of Italian SSFs would desire to overcome this critique, this thesis considers this a unique informational challenge. Indeed, this would require the MSC to analyze, respond, and potentially adjust its methodology to be considered in the state-led information system.

Notably, Expert 16 suggested that the MSC has yet to respond to her associated organization's calls to improve the certification process, even though they have been shared for several years. Even though no specific context was provided on the nature of these improvements, the MSC was either incapable of meeting these calls for improvement or ineffective in convincing stakeholders of why these improvements could not be made.

Expert 12 also noted that the MSC should focus more on their processes' ethical and social aspects. Likewise, Expert 11 suggested that sustainability must consider not only the environmental side but also the socio-economic side. He noted that the MSC might have shown improvements but needs to address these aspects fully. They have also acknowledged their lesser focus on socio-economic elements due to their primary focus on fisheries' environmental performance and sustainability (MSC, 2024c). Notably, they did publish the MSC Labour Eligibility Requirements (version 1.0) in October 2022 (MSC, 2024c). Through these requirements, MSC certified fisheries must publicly share their policies and practices to reduce egregious labor abuse. Furthermore, they have established a Social Policy team to conduct a Labour Policy Review and are continuously researching further improvements surrounding labor eligibility requirements (MSC, 2024c). While these changes do not directly relate to SSF governance, these adjustments to the MSC approach also follow the multi-stakeholder consultation process and demonstrate that the MSC can adjust its approaches when critique is considered valid.

7.4.4 Organizational Structure and Infrastructure

Four experts **(2, 4, 13, 16)** suggested that the ABALOBI must first ensure an organizational infrastructure is in place. According to Expert 4, ABALOBI desires that the catch be delivered to a certain location and packaged. He noted that this needed to be done with the VirMA project as there was no infrastructure to execute it. Instead, they only utilized the virtual marketplace aspect of ABALOBI to put fishers together with information regarding the products (e.g., price, etc.). Expert 2 also shared that ABALOBI must be tested with a limited group, as a big group of fishers would be challenging to find and unwilling to participate. She noted that the VirMA attempted that but needed more operationality. Expert 16 reasoned that this is because, when you delve into how ABALOBI works, it becomes apparent that there must be a systematic management system for the flow that the app proposes and creates. For instance, local infrastructures are required where fishers can gather with their fish baskets. She also noted that it is not enough for individual fishers to use the app to sell their singular catch to a restaurant. Instead, fishers must organize and send their baskets of fish together. This requires infrastructure where all fish comes together and gets processed by paid individuals who also manage the organization and selling of the catch.

Expert 16 also suggested that preliminary steps of organizing fishers must be taken, as simply arriving at a fleet and proposing the tool does not work, as WWF has also experienced. As follows from *Section 8.1*, building collective capacity is an informational challenge impeding processes in non-state IG and CEG, in general. According to Expert 16, a considerable amount of desk work is involved in managing the marketplace on the app to organize such market infrastructure effectively. Still, she noted that if this organizational structure is present, it could be an effective tool. However, no suggestions were provided for facilitating such an organizational structure. Expert 11 also emphasized that ABALOBI is a tool and not an organization with a presence in Italy, which means that another actor would be needed to organize and extend its structure to facilitate the particular market activities of ABALOBI. As addressed in *Section 7.4.1*, ABALOBI fits most logically as a tool that CO.GE.PA can utilize. This also means that identified necessary CEG efforts to enhance the facilitation of consortia could indirectly benefit the uptake of ABALOBI.

7.4.5 Ensuring Transparency

Expert 12 noted that the MSC should ensure open and transparent dialogues within fishing communities and with all multi-level stakeholders. Indeed, such transparency is also considered necessary by Song et al. (2020). However, the MSC already meets such requirements, as it gained legitimacy due to public recognition, following transparent and accountable procedures and outputs (Bush et al., 2013). All auditing processes are tracked and thoroughly reflected upon within publicly accessible documentation on the MSC websites (Toonen & Mol. 2013), which show what was audited and includes information on the species or stock, utilized fishing techniques, exploited locations, quantities, crew information and information of registered vessels. This info follows from different sources and can be collected by observers, cameras or AIS, paper logbooks, catch certificates, and landing declarations. Furthermore, increased transparency and inclusivity in governance processes have also been found to improve due to certification processes (Longo et al., 2021). As the MSC maintains transparency through globally accessible websites, it is difficult to reason why this informational challenge was raised. Still, a continuation of this transparency can, naturally, also be considered a challenge that the MSC must continue to face.

7.4.6 Age and Technological Adoption

Three experts **(1, 2, 8)** suggested that fishers' adoption of the app could be limited by their, on average, old age. Expert 1 noted that this app might benefit younger people as they are more familiar with technology. He suggested this would be the best target audience to propose ABALOBI to, but he doubted this would be useful for everyone. Expert 8 also noted that using a phone to collect data might be more difficult for older people and suggested that this would require some teaching capacity, too. Expert 2 also spoke from experience, as she noted that 50- to 70-year-old fishers might identify the advantage of using ABALOBI and that they could also be more involved in ICT solutions. As she said, AMAP also works to improve the competencies of fishers in using Facebook as a marketplace, as they do not know how this works either. As such, she also noted that using information and communication technology (ICT) solutions, like ABALOBI, requires training capacity. WWF (2022) also recognized that scaling up the number of Italian SSFs and consumers using this app can be challenging. In part due to the challenge of getting these groups accustomed to the technology. Still, WWF aims to make ABALOBI reproducible throughout the Mediterranean and says that this will be made more accessible when more fishers and buyers participate in this app (WWF, 2022). ABALOBI has an awareness and operational training program, which they advise fishers to use (ABALOBI, 2021). The app has a built-in program for fishers to understand the use of the logbook, the interpretation of charts and tables, and the best means of handling seafood and marketing support to increase revenues (Castillo et al., 2015). Furthermore, in South Africa, ABALOBI provides fieldwork

support in introducing the app to fishers and explaining how to register and download it. They also collaborate with the (local) Cape Access Programme, which has e-centers in local villages to offer digital literacy courses. Furthermore, in South Africa, local field worker teams also provide WiFi access, test phones, and logbook training and data engagement (Castillo et al., 2015), and perhaps a similar structure could be reproduced in Italy.

7.5 Conclusive Remarks on Non-state IG Capacities and Informational Challenges

In general, experts were considerably optimistic regarding the capacity of non-state IG to aid the facilitation of the contextualization of regulations, which followed closely from the facilitative capacities regarding data collection, strengthening market power, and representing Italian SSFs. Indeed, it was suggested that non-state IG could provide an extra layer on top of CEG efforts that would be especially valuable where CEG shows shortcomings. The applicability of the MSC and ABALOBI in facilitating contextualization of regulations was also generally perceived to be practical. Notably, the MSC was noted to provide engaged SSFs with provable legitimacy of their practices with the option of utilizing this proof in substantiating claims when legal disparities are faced. A direct example was even gained in this regard in the form of a solution that the MSC provided for the legal disparities faced by Sardinian Octopus fisheries. Furthermore, the MSC's capacity was commended for its provision of structured progress toward sustainable SSF activities and for allowing stakeholders to utilize documents following these processes. The data collection capacity of ABALOBI was mainly regarded as the capacity that can aid the facilitation of more contextualized regulations. Furthermore, the capacity of ABALOBI to assist storytelling and bring fishers together was also addressed as valuable in this ambition.

Again, most experts responded positively to non-state IG facilitating co-management. It was noted that these approaches could allow SSFs to take more responsibility in managing and understanding the issues caused by their activities. Still, it was also pointed out that this likely differs per approach and that state-appointed research institutions must be involved in these processes to ensure credibility. Multiple experts are also convinced that the MSC and ABALOBI can facilitate co-management. Regarding the MSC, it was addressed that engagement with the program and resulting documents can aid co-management approval. Notably, it was also suggested that the MSC benefits from co-management schemes, as engagement with fishers can occur more efficiently. Likewise, the data collection and stakeholder involvement in MSC processes were considered beneficial for co-management facilitation. Furthermore, endorsed LMPs are also regarded as acceptable forms of authority against which Principle 3 of the MSC Fisheries Standard can be assessed. As such, MSC engagement is also not impeded by the absence of CEG efforts. ABALOBI is already actively utilized by the WWF in Italy to increase the co-management of Italian SSFs, which proves its applicability to some extent. The tool was also commended for its adaptive capacity to local needs, aiding co-management. Furthermore, the improved accessibility to validated data through ABALOBI was also considered an empowerment in co-management facilitation. This facilitation was supposed to be further supported by its capacity to facilitate the monitoring of fishing practices, communication between fishers, and data capture and analysis.

Still, informational challenges were addressed in the applicability of non-state IG, the MSC, and ABALOBI. Experts considered that the general solutions that can aid all Italian SSFs are unlikely to follow from these approaches. Notably, experts suggested that ABALOBI is most applicable locally and can lay the groundwork for MSC engagement through enhanced market structures with traceability of products. This was deemed especially valuable as the MSC was noted to have less likely success locally, as they do not fit the market activities of Italian SSFs. Furthermore, these complementary

efforts hinted at the capacity of CEG and non-state IG to support each other, as further elaborated in *Chapter 8*.

Most experts also considered the challenge of validating non-state IG data as an informational challenge that could affect the reform of the information system. Indeed, it was noted that self-reporting must undergo validation to ensure adherence to the scientific standards of the state-led information system. Notably, non-state IG approaches, in general, and ABALOBI were discussed directly, while the MSC was not directly emphasized to desire these data collection processes. This is likely due to their more recognized credibility not immediately triggering concerns regarding data validity. Still, it is considered that the MSC must follow the same validation as any other non-state IG approach.

Two unique informational challenges for the MSC were also recognized. One was present in the fact that multiple experts expressed criticism of their applied methodology. At the same time, it was also noted that the program shows the capacity to adjust its approach when faced with critique. The second informational challenge was the need for the MSC to ensure open and transparent dialogue within fishing communities. Also, in this regard, it seems like the MSC has already considered this concern in its approach, as it is actively ensuring the accessibility to data stemming from auditing processes on its accessible website.

ABALOBI was also expected to face two unique informational challenges as a non-state IG approach. The first informational challenge is considered to be present to ensure an organizational structure to manage all activities that follow from the tool. Still, it must be emphasized that other actors must likely manage ABALOBI's utilization, as the app developers do not have a direct presence in Italy. Indeed, WWF has already taken up this task. However, CO.GE.PA likely also has a role to play in the utilization of the tool, which also means that CEG efforts to enhance the facilitation of consortia could indirectly benefit the uptake of ABALOBI. The second unique informational challenge of ABALOBI was related to the app's uptake due to the older age demographic of many SSF operators. Still, ABALOBI has already set up training capacity in South Africa, which might be reproducible in Italy. The WWF is also already rolling out awareness programs and training initiatives to facilitate the adoption of ABALOBI. Once more, the CEG system might be able to provide direct capacity here too. This is followed by the example of AMAP working to improve the competencies of fishers to use Facebook.

Both the MSC and ABALOBI are clear examples of approaches that reflect the principles that can provide the capacity to increase the level of legal, reported, and regulated Italian SSF activities. Furthermore, it shows the capacity to support overcoming some informational challenges CEG is expected to experience in reforming the information system. It can also be reasoned that CEG actors can aid the adoption of non-state IG, which hints at further complementary capacities discussed in *Chapter 8*. Furthermore, while this chapter will primarily discuss informational challenges, it especially emphasizes that state -and non-state-supported reform should not as much be considered as separate efforts as might be initially thought.

8. Shared Challenges in Recognizing Italian SSFs through CEG and Non-state IG

The previous two chapters have discussed the effects of informational challenges that were expected to be uniquely present in either CEG (*Chapter 6*) or non-state IG (*Chapter 7*) efforts to reform the information system. However, during the analysis of informational challenges, it became apparent that many were shared between the two modes of environmental governance. Likewise, some challenges were addressed by interviewed experts in a considerably general sense, limiting the ability to credibly relate their effects only to CEG or non-state IG efforts. The following sections in this chapter each discuss such informational challenges in order of the frequency with which experts identified them. Indeed, the effects of these informational challenges on the reform of the information system through applied forms of CEG and non-state IG are also discussed by triangulating them with literature. The chapter ends in *Section 8.8* with conclusive remarks on the effects of these shared informational challenges. This, ultimately, allowed a comparison of the effects of all discussed informational challenges with those discussed in *Chapters 6 and 7*, in *Chapter 9*.

8.1 Collective Capacity

Multiple indications of the necessary participation of Italian SSFs in current and novel information flows have been discussed in *Chapters 6 and* 7. However, it seems likely that all these forms of participation will be directly impeded by the lack of collective capacity of Italian SSFs, as an identified informational challenge by eight experts **(1, 2, 4, 8, 11, 13, 14, 15)**.

The Challenge of Associating with Other Italian Small-Scale Fisheries

Most Italian fishers are not associated with any group (with sub-national differences) **(4)**. Indeed, in the region of Ancona, it was deemed conservative to say that about 50% of the vessels were owned by fishers associated with a group. These associations could still show high variations in the number of members, meaning multiple associations could be present in the same area **(4)**. This also creates challenges for sub-national agencies, such as AMAP, to get in contact with fishers. For instance, if you know that there are 400 fishers in an area, no more than 15 would likely join a consultation meeting. Furthermore, even with local SSF associations, you must call a specific fisher and visit the location **(2)**. Expert 11 also suggested that fishers could be better engaged in processes leading to self-establishment. He noted that Italian fishers are excellent at performing fishing activities in any conditions but lack organizational capability and are very dependent on the work of fishery representatives. Still, as discussed in *Section 6.3.2*, the informational processes associated with these representatives are suggested as having multiple informational challenges in the CEG system.

Expert 2 suggested that fishers are often not interested in building a collective capacity. Expert 1 also addressed the individualistic nature of fishers and said that this nature inherently limits the collective capacity (as discussed further in *Section 8.4*). This individualistic nature also follows from the fact that they can be very different from other fishers operating SSFs (some work seasonally, some also work outside of the SSF industry, etc.), further limiting their interest to band together as different interests are also present among Italian SSFs **(4)**. Expert 2 also noted that the older age of fishers could limit the formulation of collective capacity, as they might, for instance, not read emails that address collective opportunities. As such, the perceived lack of technical capabilities of the average old Italian SSFs seems to provide a broader informational challenge to reform the information system, as this challenge was also addressed in the applicability of ABALOBI in *Section 7.4.6*.

Lack of Collective Capacity to Facilitate Co-management

Eight experts **(1, 2, 5, 6, 8, 9, 11, 12)** also mentioned the lack of collective capacity as a direct impediment to co-management. Expert 2 addressed the importance of consortia and associations in aggregating SSF operators to facilitate co-management. This challenge becomes apparent as Expert 8 noted that fishers must function as a cohesive team before co-management can occur. Experts 5 and 6 suggested that one of the major defects of some Italian SSFs is the difficulty of collaborating, and they addressed this as a direct impediment to the facilitation of co-management. Indeed, Spagnolo (2010) also suggested that co-management would benefit from cohesion among fishers, which is more likely for fishers utilizing similar gear in an area with homogenous ecological characteristics. This also impedes the crucial forming of LMPs with CO.GE.PA (Raicevich, Grati, et al., 2020). Expert 1 also mentioned that if you got to a fishing port with 50 local fishers proposing to participate in co-management, maybe two to five would agree to be involved. The rest would likely consider you a strange person doing strange things with other fishers. He emphasized that most fishers likely have little interest in collaborating and participating in co-management.

As addressed in *Case 6 in Section 5.3*, the involvement of SSFs in governance processes could have also benefited them in preventing a perceived unnecessary ban of the "spadara" driftnet. Such challenges have also resulted in cooperatives calling for forming a CO.GE.PA to improve recognition of these ideas and the interests of Calabrian SSFs. However, the 70% fleet participation requirement was not met when the Battaglia et al. (2017) paper was written. They were indeed proving the necessary steps to facilitate CO.GE.PA (and consequently co-management), as discussed in *Section 4.3*, can already be too challenging. It follows logically that the seemingly perceived challenge of meeting these requirements can also impede the motivation to participate in these processes.

Lack of Collective Capacity to Facilitate Contextualized Regulations

Expert 2 also mentioned that the collective capacity impedes the contextualization of regulations. She provided the example that finding fishers, collecting data with them, and engaging them in the governance process is quite challenging. She also addressed that improved collective capacity can aid administrative procedures and will allow funds to be received to make engine changes, buy new gears, and test new devices. This would also benefit the contextualization of regulations as fishers would be more likely to promote their sustainable image.

The effect of Ineffective Collective Capacity on Non-state IG

Four experts also suggested the lack of collective capacity to provide a direct impediment for the MSC **(2,4, 8, 14)** and ABALOBI **(2, 4, 7, 10)**. Expert 2 addressed that the VirMA project also experienced a considerable challenge in finding a group of fishers willing to work with the app. Expert 4 considered the lack of collective capacity on a national scale as a direct impediment to ABALOBI being utilized as a national solution. Notably, Expert 14 suggested that the success of LSFs in MSC certification processes also follows from the fact that they are more organized and capable of handling administrative procedures. Expert 4 also suggested that fishers would have challenges participating in the MSC PSP, as most vessels are not associated with any group. According to him, reaching multiple SSFs without a national or local association would be too difficult. Indeed, this can also be translated into the value of such capacity in Italian SSF governance. Expert 2 also suggested that AMAP has already experienced considerable challenges getting fishers to apply for EU funds. As such, she also expected similar challenges for the MSC, even with the promotion of funding through the OSF.

Still, Experts 5 and 6 also suggested that non-state approaches can bring fishers together. More specifically, three experts **(2, 9, 14)** noted that the MSC can aid the formulation of collective capacity. According to Expert 9, the MSC can facilitate collective capacity, as she closely related certification

processes with participatory governance. Expert 2 also suggested that the MSC can be an intermediate party that facilitates multi-stakeholder collaboration, especially since they do not represent the government. As discussed further in *Section 8.2*, the mistrust of SSFs in the CEG system also results in less interest in participation; following this reasoning, it might be that the MSC has more success convincing SSFs of the necessary participation. Also, ABALOBI was suggested by four experts **(2, 4, 7, 10)** to aid collective capacity. According to Experts 2 and 4, the application of ABALOBI is also explicitly intended to provide fishers with a reason to collaborate. Indeed, this also follows from the ABALOBI Manager app, as commitments to each other can be monitored, allowing fishers to communicate directly with each other (Castillo et al., 2015).

8.2 Trust

The saying "trust works both ways" seems to hold considerable relevance in the challenges surrounding state -and non-state-supported information system reform in Italian SSF governance. Indeed, many experts have suggested the concept of trust as an informational challenge in multiple forms. Indeed, this multi-faceted challenge also follows from Raicevich, Dubois, et al. (2020), as they suggested little trust within and between stakeholder groups in Italian SSF governance.

Distrust of Italian SSFs in the Conventional Information System

According to Expert 2, SSFs distrust the informational processes in the current multi-level information system. She noted that from consultation processes with SSF operators, it emerged that they have difficulty understanding how research institutes composed and detected data on the health of stocks and catch efforts. As she suggested, this debate around data collection also often occurs during meetings and events where fishers and research institutes meet. She noted that improved data provision should reduce these conflicts and that fishers must be involved in these processes. According to Bradley et al. (2019), the state-led information system is significantly impeded by the lack of trust from fishers, as the disconnect between SSFs and the information system also impedes how data is considered in regulations.

Glenn et al. (2012) suggest that building trust within participatory governance processes requires common and mutual understanding. This process must be ongoing and depends on a two-way dialogue, exchange of information, and recognition of cultural and institutional contexts to meet the needs of all stakeholders. This might also partially explain why eight experts **(1, 2, 9, 10, 11, 13, 14, 16)** emphasized that SSFs must understand governance for it to be effectively implemented. Expert 9 addressed that it was important for fishers to be trained to understand the ecological and environmental dynamics associated with their activities and why regulations are necessary. She specifically related this to being at the heart of effective co-management and that conveying the economics of sustainability must be ensured to motivate participation.

Distrust of Italian SSFs in Data Collection Processes

According to Expert 2, the participation of SSFs could also improve the trust of SSFs in the data collection processes. As she suggested, SSF consultations have shown a limited understanding of how research institutions' data on stock health and fishing efforts is composed and detected. This also causes conflicts between researchers and fishers. However, Expert 1 also noted that fishers do not always declare truthful situations. Specifically, he explained that SSFs with vessels 8-10m long with passive nets are unlikely to catch very heavy tuna species of 100-200kg, especially in shallow coastal waters. Thus, the demands of fishers with unlikely characteristics to catch such species should be critically reflected upon, which also demands data. Still, Expert 1 also suggested that SSFs with longline gear could catch such species, which means that the governance challenges discussed in *Case 2 in Section 5.3* are not, per definition, contradicted by him. Still, Bradley et al. (2019) also

suggested that fishers are very wary of sharing their data without receiving benefits. In fact, they noted that fishers are especially wary due to privacy concerns regarding the recording of fishing locations and other "trade secrets". Furthermore, they might fear the option that data provision might result in the discredit of their activities and additional restrictions. Indeed, this also seems to support the suggestion shared in *Sections 7.3.1 and 7.3.3* regarding the MSC and ABALOBI's capacity to contextualize regulations concerning ETP species. The fear of additional restriction was also suggested to limit their motivation to share data on interactions with these species. Therefore, fishers must understand how reporting these catches would provide benefits that outweigh the risks of additional restrictions.

Distrust of Italian SSFs in Non-state IG

Expert 1 also suggested that non-state IG must show that they are working to help fishers for the survival of their economy and of their activities and that if the economy of the local fishery is ensured, little modifications of technical aspects (e.g., changing locations, changing depths of nets, dimensions of the hooks, etc.) can gradually take place.

More specifically, it was also suggested that trust of SSFs in ABALOBI must be facilitated **(8, 10, 16)**. Expert 8 emphasized the need to effectively explain the benefits of using the app so that they do not only perceive it as just another rule or control system they are obligated to adhere to. As follows from Castillo et al. (2015), ABALOBI has considered this in their approach, as it incentivizes fishers to share specific aspects of their data with stakeholders. Still, they also addressed that they can show reluctance to share certain data, like preferred fishing spots and local knowledge, as it might limit their competitive advantages. Expert 14 also mentioned that the MSC must always ensure SSFs trust the program. A regular effort toward SSF operators must take place to explain what the MSC does and why they do it. According to him, this was also an understandable effort, as it might appear like the MSC is selling something. Furthermore, he noted that fishers might have a preconceived image of an NGO, which does not favor how they respond to the MSC. However, he shared that trust can be built with sufficient time by explaining what the program truly stands for and how it benefits them.

Gaining Trust through Understanding with Non-state IG

However, three experts **(2, 13, 16)** also suggested that ABALOBI can aid the understanding of fishers. Expert 2 suggested that ABALOBI has one of the most effective, coordinated, and accessible forms of communication toward fishers, which the CEG system might sometimes lack. Expert 13 noted that ABALOBI's most valuable feature is that fishers would see the value of collected data as well, as it serves them to realize the impact of their activities better, how to manage it effectively, and how they can use their data to express their ideas. Expert 16 also suggested that ABALOBI can educate fishers on the importance of having their own data and guide them in seeing how it can be used locally. Creating a knowledge base and crafting a logbook were also suggested by Raemaekers (2020) to empower fishers within value chains. He also noted that data limitations inherent in SSFs may sometimes result in fishers perceiving regulations stemming from assessments as illegitimate. According to him, ABALOBI could aid in overcoming this challenge.

Two experts **(11, 14)** also suggested that the MSC can aid the understanding of Italian SSFs. For instance, the program might indirectly aid a fisher's understanding of the value of grouping and working toward co-management, as the MSC facilitates exchanging knowledge and experience between MSC-engaged fisheries **(14)**. This is exemplified by exchange projects that the MSC organized, in which Italian SSFs visited a certified Spanish fishery, which also provided Italian fishers with insights into the advantages of engaging in the enhancement of their practices to achieve sustainability, as well as the benefits of participating in certification **(14)**. According to Expert 11, the MSC provides a path for fishers to understand where they are progressing toward sustainability, what

defines illegitimate behaviors, which data is needed, and how they can change their practices. Indeed, Longo et al. (2021) also suggested that the MSC program promotes a culture of adherence to CEG and non-state IG through increased dialogue and trust in institutions. It demands fair and transparent informational processes. The reporting of information can also improve stakeholder cooperation and, thus, reinforce a culture where compliance with regulations is considered the norm (Longo et al., 2021).

8.3 Financial Costs

According to Hoefnagel et al. (2013) the implementation of IG can be impeded by information transaction costs, which they define as *"the costs of gathering information, evaluating alternative options, negotiating, contracting, monitoring, enforcing and the physical transaction of the object"* (P. 152). Furthermore, they also address the informational challenge of information search costs, which are related to the necessary costs to strategize and coordinate the informational processes. Indeed, such challenges were also shared by the experts in the context of the applicability of non-state IG. However, it was observed that these financial costs are also an informational challenge in enhancing the information flows in CEG that would impede the necessary reform of the information system to facilitate the contextualization of regulations and co-management. Indeed, experts identified the costs of enhancing current information flows and validating novel ones as a common challenge, as discussed below.

The Communication of Funding Options

The necessary financial costs to ensure the recognition of Italian SSFs were also mentioned in multiple interviews as providing an informational challenge. Six experts **(1, 2, 4, 11, 13, 16)** addressed that the EU funds aid the recognition of Italian SSFs. Indeed, as mentioned in *Sections 4.1 and 4.2,* the EMFAF provides financial support to projects that aid the recognition and co-management of Italian SSFs. Still, two experts **(2, 12)** also suggested that the CEG system should improve the communication surrounding the option of SSFs to fund their activities. Expert 4 suggested that fishers have little access to the funds because they do not know about the opportunities, in most cases, for improving their technical aspects (e.g., engines, gears, etc.). Expert 2 also mentioned that there are very few requests for funds from SSFs in the region of Marche, even though AMAP is actively promoting support in reaching EU funding for their practices. She noted that this might also be due to the need to improve the communication from the multi-level CEG system toward SSFs. This has also been addressed by Grati & Perretta (2022), as they also recognized insufficient communication with local administration and limited awareness of EU funding.

Still, considering AMAP's active and communicative approach, the challenge seems more complex and cannot immediately be considered ineffective CEG efforts. Indeed, the lack of communication toward Italian SSFs has also been addressed in *Section 6.3.2* regarding the communication on participation in stakeholder involvement processes. This emphasizes the need to reform the information system to improve general communication with Italian SSFs. However, considering *Section 8.1*, it might also be that communication will face considerable challenges in reaching fishers, irrespective of state efforts to enhance how communication takes place.

The Costs of MSC Adoption and the Applicability of Their Ocean Stewardship Fund

The MSC's adoption by SSFs has also been suggested by seven experts **(2, 4, 5, 6, 11, 13, 14)** to be impeded by the financial costs associated with the certification process. All these experts discussed that SSF operators do not have enough economic power to become certified. However, it must be noted that the MSC PSP does not necessarily demand the costs of the auditing process. Participation in an MSC Pathway Project is entirely voluntary; a SSF can decide how much they work and the funds they want

to invest in. Still, sustainable progress can also be financially supported through the OSF (as mentioned in *Section 7.1.2*). Nonetheless, Expert 2 also suggested that AMAP has already experienced considerable challenges in getting fishers to apply for EU funds. As such, she also expected similar challenges for the MSC, even with the promotion of funding through the OSF. This would mean that non-state IG approaches can experience similar challenges in communicating with Italian SSFs, also limiting the adoption of these approaches in the information system.

The Costs of Enhancing Conventional Information Flows

Three experts **(2, 9, 10)** also reflected on the extra costs and capacity required to enhance the data collection processes. Expert 9 noted this as a challenge that would be imposed on both the information system and the fishers. For instance, introducing VMS was noted as likely too difficult or expensive for SSFs. However, she also noted that a balance must be struck regarding spent resources and capacity to improve data quality. This was also exemplified by Expert 10, who noted that the cost would be too high to put observers everywhere. Expert 2 also shared that she performed projects with low-cost tracking systems, which she suggested could be tested more effectively by paying a group of ten fishers to use them or buying the device for them. Indeed, as Hoefnagel (2013) also states, enhancing information flows is often associated with extra costs, which can incur challenging discussions. Still, Expert 1 also shared that only financially incentivizing fishers can be a vicious circle, as it is money-dependent. Instead, he noted that fishers must understand that collaboration with scientific institutions, NGOs, fisheries organizations, and the CEG system ensures their future and should not come from the money provided as a short-term incentive. He emphasized that if you want to establish a new system and progress toward low-impact activities, you must collaborate daily with the fishers who know their problems best.

8.4 Different Ideologies and Discourses

Eight experts **(1, 2, 4, 10, 11, 13, 14, 16)** also suggested that ideologies and discourses that differ between SSF operators and other stakeholders would obstruct the enhancement of the CEG information system and the implementation of concepts of non-state IG.

Experts 1 and 2 emphasized that this challenge mostly stems from the individualistic nature of Italian fishers that operate SSFs. As suggested by the latter of the two, they are also not happy to work together, and it can be challenging to talk with them in a group. He also mentioned that they are almost always alone on their boat. This also challenges speaking with them when they come back to land. Even more so if you intend to convince them that they must change something or attend a meeting. He suggested that this psychological challenge is poorly recognized in the EU, where the discussions are more theoretical and do not reflect the actual situation. He also suggested that fishers are perceived as well-informed environmentalists in the EU, even though they are not actively participating in new elaborations or strategies to minimize their ecological impact.

According to Raicevich, Dubois, et al. (2020), there is a widespread lack of agreement between stakeholders, which already takes form on fundamental descriptors of fisheries and exploited resources. As such, they deemed this a “wicked problem” in which multiple groups cannot agree on the issues or the methods to solve them. With this in mind, it is reasonable to assume that similar challenges can also be expected in which methods should be applied in the information system's state -and non-state-supported reform. Arts et al. (2000) also addresses this challenge of differing ideologies. They suggest that a policy discourse must be formulated that ensures a collectively shared perspective on comprehending the world. Using effectively considered language can also support interpreting information in a shared fashion and constructing cohesive narratives. Indeed, if Expert 1 is correct, there would be a need for a more effective multi-level alignment of the policy

discourse surrounding SSF governance, which must be considered as one of the central aspects in the state -and non-state-supported information system reform.

8.6 Political Willingness

Six experts **(1, 2, 3, 13, 15, 16)** suggested that political challenges should also be expected in the contextualization of regulations and co-management of Italian SSFs. Expert 10 exemplified this by suggesting that improving data collection through the new Regulation (EU) 2023/2842 (2023) does not directly mean that EU Member States will effectively implement it in national and sub-national regulations. Indeed, this is similar to the fundamental aspects of the challenges stemming from the multi-level approach in the state-led information system. However, the challenge in this section considers how state authorities in the CEG system would follow advice on effective governance measures. Expert 3 also noted that the challenge is not a lack of information to improve the contextualization of regulation but probably a lack of political view and willingness to utilize the information effectively. Expert 1 also mentioned that the contextualization of regulations might be impeded by attempts of politicians to win votes by giving fishers illegitimate rights to catch tuna, even though it is apparent that they would do so with unregistered gear (i.e., other than gill nets, as discussed in *Section 6.1.2*). As Spagnolo (2010) also suggests, there is a clear likelihood that the involvement of many decision-making authorities with different objectives and the distance from local circumstances are limiting the governance system.

Furthermore, due to the unknown heterogeneity of socio-ecological characteristics present in governance processes, enforcement of IUU regulations is limited, with the regulations having different and unknown impacts in different local contexts. According to Spagnolo (2010), management plans as a response to GFCM recommendations must also be formulated at the appropriate scale to allow for the implementation and enforcement of the proposed regulatory measures. They consider the need for the GFCM to facilitate a more robust means of deciding on and enforcing regulations while also pointing out that the challenge in this reform might be more political than informational. This also follows Ramírez-Monsalve et al. (2021), as the hindrance of informational processes also lies in the bottleneck between the provided advice and the decision-making, which both technical and political dimensions might limit. Specifically, he suggests that the ecosystem approach to fisheries management (EAFM, which is much aligned with principles of CEG) brings out explicit trade-offs, and decisions involve both winners and losers in the fishing industry. Furthermore, they noted that the prevailing decision-making approach revolves around isolated decisions and operates by considering interactions and choices in intricate scenarios, contradicting the general process that the CEG information system is intended for.

Furthermore, as also suggested by Spagnolo (2010), the multiple decision levels of governance, deciding Italian SSF regulations, could impede the initial priorities, as each level is the expression of different interests that are not inherently contributing to shared objectives, even when policies have formulated objectives. Spagnolo (2010) also suggests that socio-economic subsidies often are not provided sub-nationally, as is nationally desired. He said this would result from national and sub-national authorities having different and incoherent objectives. Spagnolo (2010) suggests that the EU and national authorities can share objectives, but this is not the case between Italy and its regions. They emphasized the need for multi-level coherence and homogeneity in resource management to implement measures without distortion in the governance mechanism. Spagnolo (2010) also noted that this is not the case in Italy, where the EU and Italy seem better connected than Italy and their administrative regions.

Four experts **(1, 9, 13, 16)** also addressed that political challenges can limit the endorsement of non-state approaches. Expert 9 suggested that governments change, and politicians come and go, so it can be challenging for non-state approaches to build institutionalized relations and the sustainability of those relations over time. This, again, suggests the relevance of the notions of Ramírez-Monsalve et al. (2021), who suggest that the adoption of non-state approaches also follows directly from political willingness. It was also mentioned that it is a political option for MiPAAF and DG MARE to consider if a non-state approach can produce scientific data **(1)**. According to Expert 1, the effectiveness of non-state approaches also depends on the absence of political interest in motivating their activities. As suggested by Expert 16, there also seems to be an increasing political will to allow non-state approaches to provide information, especially with the change in the Italian government. This can also be supported by Bradley et al. (2019), as they noted that data gathered in SSFs often face limited integration and utilization by the CEG information system. Furthermore, they suggested that the reluctance of scientific institutes to endorse third-party data without a specific directive hampers the motivation for managers to incorporate and leverage industry-acquired data. Bradley et al. (2019) also suggested that the disparity between the nature of collected data and government standards and their potential misalignment with existing harvest strategies introduces additional institutional obstacles in embracing and utilizing novel information flows.

According to Simard et al. (2014), there is a widespread acknowledgment of inadequate coordination between Italian ministries within and across ministries. Consequently, international negotiations often lack a consensus on national policy and a unified stance on environmental and fisheries issues. This lack of cohesion undermines regional governance implementation, highlighting the necessity of government coordination and coherence.

Expert 11 also noted that from a multi-level perspective, there seems to be more attention on SSFs at the European and international levels, with attempts to translate these concerns into national policies. However, he also noted that there had not been a complete and constructive national shift in attention toward Italian SSFs. According to Simard et al. (2014), the effectiveness of the implementation and the monitoring of compliance is also likely quite variable per Member State due to different cultures and political systems. As such, they also suggested that the GFCM must collaborate closely with other intergovernmental organizations to ensure the impact of SSFs on ecosystems is most effectively controlled. In this line of reasoning, it makes sense that this relationship would also benefit other governmental objectives.

8.7 Complementing Conventional with Informational Governance

The shared informational challenges that must be overcome in the enhancement of the current multi-level information flows, and the validation of novel information flows suggest that there are also shared considerations and efforts that state and non-state IG actors must make to facilitate more contextualized regulations and co-management of Italian SSFs. Possibly, this also indicates opportunities for these actors to combine their efforts. Indeed, in the previous sections of *Chapters 7 and 8*, it was already discussed how apparent shortcomings of the information system, as a response to CEG pulling mechanisms, could be resolved with some of the facilitate capacities of non-state IG. Furthermore, in *Sections 7.3.6 and 7.4.1, it was* suggested that non-state IG approaches can complement each other's activities. Specifically, it was noted that ABALOBI's more facilitative capacities on a local could aid the MSC by laying a foundation for auditing processes related to the traceability of products and that the MSC might provide a platform for more national growth of ABALOBI, too. However, three experts **(7, 9, 11)** also explicitly addressed that state and non-state IG approaches can support each other in the reform of the information system. For instance, it was suggested that there is a need for a simultaneous top-down and bottom-up approach, resulting from

non-state IG on one side and CEG on the other (9). Still, Expert 7 also emphasized the importance of any non-state approach having legislative coverage to prevent institutions from operating independently and the need for a basic set of regulations that all parties must comply with. Mol (2006) also emphasized how the role of IG can complement CEG efforts, especially in transboundary processes. Indeed, non-state IG and CEG also experienced challenges with the multi-level institutional and SSF-specific characteristics. Furthermore, the value of complementing non-state IG with CEG (and vice versa) also follows from the notion that many informational challenges are shared between both forms of governance when reforming the information system. As such, it might increase the efficiency of the reform if these informational challenges are also approached jointly by non-state IG and CEG actors. Mol (2006) also considered it challenging to see how IG could replace CEG efforts without marginalizing its considerable importance in environmental conservation. Following this line of reasoning, the value of replacement also seems illogical when complementary efforts can take place instead.

Expert 11 specifically addressed the relationship between state and non-state IG approaches by addressing the activities of the MSC. He noted that it is impossible to rely only on certification in governance, as certification adopts rules that define specific circumstances. This was contrasted by the deemed necessity of CEG to focus on the best rules to improve management in a broader context. As such, certification schemes cannot substitute for the role of CEG but can support shared objectives. This also aligns with Wijen & Chiroleu-Assouline (2019), who suggest that the MSC's way of working is based on their intent to complement and catalyze government legislation instead of replacing it. Expert 7 also suggested that organizations like the MSC addressed unmet needs that were not initially covered at the EU level. This hints at the facilitative capacity that Langhorne (2005) suggests concerning non-state actors coming into play when crises are beyond the control of state authorities.

8.8 Conclusive Remarks on Shared Informational Challenges in CEG and Non-state IG

While not directly contradicting the notion that informational challenge increases in severity, as suggested by Song et al. (2020) when moving from state to non-state-supported reform of the multi-level information system, this chapter has emphasized that informational challenges should not be considered as inherently unique between these two modes of environmental governance. Indeed, it has been found that multiple informational challenges relating to the lack of collective capacity, distrust in state and non-state IG approaches, financial costs considered in the reform of the information system, different ideologies and discourses, and political willingness are very much shared informational challenges in state and non-state supported reform.

Furthermore, it has been found that one informational challenge can also strengthen another informational challenge or limit the solution for another informational challenge. For instance, the unique individualistic nature of Italian SSF operators is also likely to restrict the facilitation of collective capacity. Furthermore, the lack of collective capacity is also expected to draw efforts to enhance communication toward these operators into questions regarding participation in stakeholder involvement processes or funding options, as there might not be an effective way to reach these fishers anyway. These are just two examples of how informational challenges can relate. However, considerably more combinations can likely increase the complexity of finding solutions for informational challenges.

Interestingly, while the relation between informational challenges can be expected to affect both state -and non-state-supported reform of the multi-level information system, it has also been found that state and non-state IG principles can affect the reform of the information system in a

complementary form. This aligns well with what was already indicated in *Chapters 6 and 7*, as it should be considered that CEG and non-state IG can have an impeding and supportive relationship. As such, the way informational challenges affect both state- and non-state-supported reform of the multi-level information system will likely also very much follow how both CEG and non-state IG are considered in methods to mitigate the effects of informational challenges. As presented in *Chapters 7 and 8*, non-state IG approaches also provide multiple facilitative capacities deemed valuable in the facilitation of contextualization of regulations and co-management of Italian SSFs, as well as the mitigation of informational challenges that can be expected in CEG efforts. Thus, whether these facilitative capacities can be utilized to achieve more legal, reported, and regulated Italian SSF activities also seems to largely depend on whether the CEG system is willing to perceive validating their novel information flows as an endeavor with potentially considerable value.

9. Discussion

Exploring informational challenges associated with facilitating contextualized regulations and co-management of Italian SSFs has revealed a nuanced landscape. This provides a more concrete understanding of what can impede formulated actions in the GFCM 2030 Strategy and the RPOA-SSF regarding enhancing the multi-level information system and the desire to seek non-state approaches in support of better recognition of Mediterranean SSFs. Insights were also gathered on the current state of governance concerning the contextualization of regulations and co-management of Italian SSFs. This exploration was enlarged by evaluating the expected capacity of Mediterranean non-state approaches to facilitate these two strategies to increase the presence of legal, reported, and regulated SSF activities. More specifically, the research has gathered insights into expected similar and different informational challenges in the information that responded to pulling mechanisms of CEG and novel information flows that followed from principles of IG through state and non-state approaches.

9.1 The Path Toward Contextualized Regulations of Italian SSFs

Building on the findings of Song et al. (2020), there is a pressing need for multi-level state authorities to be comprehensively informed and develop and refine IUU policies using precise language that considers the diverse socio-ecological characteristics of Italian small-scale fisheries (SSFs). This approach can lead to establishing more context-specific SSF regulations that effectively differentiate between activities aligned with multi-level conservation objectives—such as those concerning stock and habitat status—and those not. Jentoft (2007) suggests that this adopted method considers contextual factors, requiring high-resolution data (e.g., on the particularity of habitats, spawning grounds, and biotopes) and the integration of vertical knowledge that enables a deep understanding of ecosystems. Furthermore, socio-economic characteristics (e.g., relating to stakeholders, their situations, ambitions, and rationalities) were noted to contextualize regulation effectively.

This thesis shows that Italian SSF regulations are not sufficiently contextualized. Primarily, this seems to result from too abstract efforts to recognize Italian SSF particularities on higher scales of governance by coming to all-encompassing definitions carried forth down the multi-level governance system. Likewise, it has been shown that the effectiveness of non-state IG would decrease when moving up the scales of governance and that widespread and generalized non-state solutions are more challenging. It was also suggested that the current CEG system cannot reach everything and everywhere or be fully informed without the involvement of non-state IG. While the notion of such support has already been presented by Langhorne (2005), this thesis presents novel findings regarding the multi-level differences of influence of non-state IG on CEG in relation to the contextualization of regulations.

It has also been shown that the lack of considered socio-economic sustainability and the social repercussions of regulations might limit the identification of suitable market-based solutions. Indeed, this suggests that the ineffectiveness of CEG information processes indirectly also impedes the applicability of non-state approaches, such as the MSC and ABALOBI. This thesis has also demonstrated that the applicability of non-state IG is also impeded by the direct political willingness of state approaches to allow for their adoption, providing a multi-level case that supports the notion of Ramírez-Monsalve et al. (2021).

Furthermore, additional indications of how the CEG system might have a good framework with generic regulations and a regionalized approach have been provided. More importantly, it has been shown that the informational processes within the CEG system primarily impede the reform of the

information system to allow for more contextualized regulations. Indeed, a considerable challenge in the multi-level information system reform follows from the currently applied approach and the nature of Italian SSFs that impede effective data collection. This is just one of the flows that show signs of necessary enhancement or support through non-state IG. In fact, experts widely believe that non-state IGs can aid the facilitation of more contextualized regulations through their capacity to bring attention to certain issues. More specifically, it was deemed likely to play a role in data collection, representation, and mediation processes. This can be considered beneficial for gaining an in-depth understanding of the complexity of the Italian SSF industry. Still, the validation of novel information flows from non-state IG should also be anticipated as a significant informational challenge before these facilitative capacities can be utilized. This necessary validation was also suggested by Song et al. (2020), which means that this thesis supports the notion that most informational challenges in non-state-supported reform of information systems are likely to occur in the validation of novel information flows. Indeed, the multi-level information system must be capable of validating that additional data flows will not create further challenges and experiences in current information flows. Still, the MSC and ABALOBI have shown capacity for providing high-quality data, as well as accessibility and transparency for such validation to take place.

9.2 The Path Toward Co-management of Italian SSFs

As Song et al. (2020) suggest, bespoke mechanisms are needed to facilitate co-management management systems through self-reporting and self-control of SSFs. This thesis has shown that the effectiveness of facilitating these co-management schemes through CEG efforts requires considerable improvement. For instance, multiple experts emphasized the need for DG MARE to implement legislation that provides administrative, economic, and advisory tools for EU member states and the fishing industry to adopt co-management models effectively. Indeed, this was also requested in the non-legislative act by the European Parliament in May of 2023. While international state authorities have now expressed the need for a direction toward co-management on a national scale, national governance frameworks must also provide a legal framework and support to local committees so that they genuinely have the capacity to manage local areas. Still, it was deemed that there was a lack of genuine national and political willingness to adopt such a framework. Once again, supporting the claims of Ramírez-Monsalve et al. (2021), this political willingness, interestingly, can be considered a double benefit when applied to the acceptance of non-state IG approaches. Indeed, it has been found that non-state IG approaches can also provide facilitative capacities in the facilitation of co-management schemes of Italian SSFs.

For instance, it was noted that ICT could help these processes and that non-state IG has a role to play in the capacity of fishers to manage their issues responsibly and the capacity to understand the cause of issues, while this could also differ considerably between each approach. Moreover, it was suggested that non-state approaches must always be accompanied by research and academia to ensure they effectively guide the associated co-management processes. However, it could be proposed that with sufficient validation of the credibility of a non-state IG approach, the CEG system could also free itself from the burden of having to guide and control each non-state approach in its daily activities. In the end, the current state-appointed institutions were also once not endorsed by the multi-level information system and are now trusted to perform their activities credibly. Indeed, such state endorsement could considerably reduce state efforts to control and monitor SSFs. This delegation might unlock IG's genuine potential, as Mol (2006) proposes, in which information takes the central role and the authoritative forces take the backseat.

While both the MSC and ABALOBI were shown to provide facilitative capacities for co-management, it was suggested that ABALOBI would have more capacity to facilitate co-management than

regulations. This finding also somewhat aligns with the notion in the conceptual framework that non-state approaches would mostly take the lead in the facilitation of co-management while also providing support to the contextualization of regulations. However, this notion is also contradicted by the fact that one expert suggested that the MSC has more capacity to aid the contextualization of regulations than the facilitation of co-management. Furthermore, while not being compared by experts based on valuation in this regard, both ABALOBI and the MSC were suggested to have multiple facilitative capacities in contextualizing regulations and co-management of Italian SSFs. Furthermore, it should be noted that the lack of capacity of the current CEG system also somewhat contradicts the conceptual framework, in the fact that the associated information flows of the CEG system seemingly desire a near equal radical reform to that the of information flows responsible for the validation of novel information flows arising from non-state IG.

9.3 Informational Challenges - To Govern Conventionally or to Govern Informationally?

In presenting the theoretical and conceptual framework (see *Chapter 2*), it was reasoned that with CEG, most informational challenges would follow from enhancing information flows responding to pulling mechanisms. On the contrary, it was suggested that non-state IG information flows would provide pushing mechanisms more associated with informational challenges pertaining to the validation of the credible and legitimate representation of Italian SSF circumstances. Indeed, these propositions align quite well with the research findings. Most of the expected effects of informational challenges on the multi-level information system reform through CEG efforts are related to enhancing information flows rather than replacing them with novel ones. More specifically, clear patterns were identified in what experts perceived as necessary enhancements in the state-led information system (i.e., data collection, assessments and advisory processes, and stakeholder involvement) before contextualized regulations and co-management of Italian SSFs could be facilitated.

Multiple experts suggested a considerable lack of quality and quantity of Italian SSF data in the CEG system. This resulted from a lack of SSF participation and data submission obligations, specifically exemplified by the lack of enforced data provision through logbooks and AIS systems. Interestingly, the CEG system acknowledged this challenge with the approved Regulation (EU) 2023/2842 (2023). It has been noted that non-state IG can also aid the implementation of these regulations. Still, it can be questioned if this is the right approach, as increasing such authoritative demands was also addressed as increasing the burden on Italian SSFs. This could also create a considerable impediment to their daily activities. As such, the governance's ambition to reduce existential threats through more authoritative informational demands might actually add to the challenges that SSFs already face.

Reaching a shared and adequate multi-level definition of Italian SSFs was also deemed near impossible, even though the current definition still provides challenges on a local scale (e.g., in the formulation of CO.GE.PA). Most notably, the current multi-level approach was discussed as an informational challenge in data collection and stakeholder involvement processes, as well as a general informational challenge throughout the entirety of the CEG system. The proposed local adaptability of non-state IG might provide an answer to such challenges. This might be worthwhile considering, case-by-case, by assessing the complementary interactions between state and non-state approaches in certain geographic locations.

Expected informational challenges in non-state IG approaches were mainly associated with validating novel data from non-state approaches, as it was deemed unlikely for the DCF to adopt such data due to statistical and methodological differences in the approaches. Experts noted that this data would need to follow a validation process of multiple years before the CEG system would accept it. These

challenges were addressed in reflection on the general applicability of non-state approaches and specifically in the application of the MSC and ABALOBI, emphasizing how theoretical expectations met the research results. However, through direct and logically interpreted expert suggestions, it can be reasoned that the informational challenges of applying non-state approaches to aid the recognition of Italian SSFs in governance processes are also expected to be considerably limited by the multi-level nature of these processes. Multiple experts also addressed that implementing solutions with a general (i.e., multi-level) effectiveness would be challenging due to multi-level differences in the status of fisheries, the absence of significant risk, infrastructural and collaborative needs, and the different needs of the CEG system. This notion was again the result of a general reflection on the applicability of non-state IG, as well as the applicability of the MSC and ABALOBI.

Multi-level differences in representation processes were considered challenging, too. SSFs often have more local and direct management interactions, while management plans focus more on internationally shared stocks. Italian SSFs are usually only active at a very local level and with few representatives. In contrast, LSFs have considerable power in multi-level representation processes. Furthermore, experts also suggest that the multi-level differences in the CEG approach provide an informational challenge in itself, as the level of engagement with SSFs can vary widely from country to country and even sub-nationally. This also impedes the likelihood that the contextualization of regulations might favor SSFs, due to an imbalance in the representation between competing industries. Notably, CEG was considered to work best locally, as management at the national level can sometimes be considered too broad. With this in mind, it stands to reason that most investments spent on effective contextualization of Italian SSF regulations and the facilitation of co-management are best approached on a local level. In turn, the gathered and validated information should be more effectively be considered in the higher levels of governance.

The informational challenge of multi-level differences also gave rise to a notion not directly considered in the theoretical and conceptual framework, namely that informational challenges could also be identified as shared by CEG and non-state IG. This also followed the identification of a lack of collective capacity, trust, financial costs, differing ideologies and discourses, and market and political challenges as providing informational impediments to CEG and non-state IG. Furthermore, while political challenges were addressed as likely informational challenges to non-state IG in the theoretical and conceptual framework, experts identified these challenges as not only impeding the validation of novel information flows but also the enhancement of current ones in the CEG system. For instance, it was noted that it might not be a lack of information but a lack of political vision and willingness to utilize information to contextualize regulations. The absence of political interests in non-state IG was also deemed as one of the beneficial aspects. As both these modes of governance are affected by the same informational challenges, the solution would be best explored by considering the strengths and weaknesses that both these modes can also provide to mitigate their shared informational challenges.

9.4 Non-state Approaches Fulfilling Their Ambition?

According to Mol (2006) and Langhorne (2005, non-state IG would have the capacity to solve crises that CEG cannot. Song et al. (2020) suggested that when the primary scale of action shifts to non-state approaches, the radicality of reform would also increase.

Some of the interviewed experts seemed to assume that with the proposed applicability of non-state approaches in the governance of Italian SSFs, non-state approaches were proposed to replace the CEG system completely. However, it became apparent from the facilitative capacities shared by experts and the informational challenges that both state and non-state approaches possess distinct

strengths and weaknesses. The CEG system offers a necessary structure resulting from a critical multi-stakeholder evaluation of statistical and methodological processes. However, it lacks the extensive reach and local adaptability that non-state IG can provide. As such, it seems reasonable to assume that in optimally effective governance, both modes of governance require each other's presence.

While many of the informational challenges were shared, it was also noted that non-state approaches were also deemed to provide somewhat of a solution for some of these shared challenges. For instance, in the general application of non-state approaches, the MSC and ABALOBI were all deemed to have the capacity for bringing fishers together (and building collective capacity), improving understanding of governance (and associated procedures), and building trust in the CEG system, and aiding market power. The relevance of non-state approaches in combatting the latter could prove especially valuable because the power of market institutions and competitive advantages of other fleets already directly threatened SSF livelihoods and impeded the facilitation of contextualized regulations and co-management of Italian SSF regulations. As such, the improved traceability and negotiating power of Italian, that the application of non-state approaches could provide, would not only benefit the identified strategies of Song et al. (2020) but would also resolve some of the existential threats that Italian SSFs face. This also indicates that non-state approaches could seemingly fulfill their characteristic nature, as defined in the theoretical framework, where they play a significant role when crises seem to lie beyond the control of government or relevant intergovernmental organizations.

Still, it was also noted that care should be assigned to ensuring that not too many non-state approaches are utilized, as this would cause confusion. While this point holds validity, it also became apparent that the CEG system already includes a seemingly confusing and misaligned approach with the observed co-existing multi-level definitions of Italian SSFs. Furthermore, the aggregation of data and the suggested working group duplication in assessment and advisory processes also indicate a waste of human resources and investments in the CEG system and the credibility of the CEG information system. Indeed, it was even noted that within the CEG system, knowledge is sometimes absent of which activities take place on other levels. It might be that non-state IG could aid in overcoming such CEG challenges. Most importantly, these current challenges also provide grounds to speak against the logic of deeming the applicability of non-state IG as confusing, as confusion already seems to be present. Of course, there is logic in ensuring this confusion does not increase further, but it could prove valuable to explore how confusion in the CEG system might be reduced with the introduction of non-state IG.

Notably, it was found that non-state approaches do not only have a facilitative capacity to complement CEG. Instead, it was also suggested that ABALOBI and the MSC complement each other's activities. Bradley (2019) also suggested that integrated online reporting systems capable of recording data at multiple points in the supply chain of an SSF might aid their traceability and provide some groundwork in MSC certification processes. Still, it must be noted that ABALOBI ensures traceability is not explicitly described in the literature and can seemingly only be deducted in two videos (ABALOBI, 2022; SnapScan, 2020). Apart from this indication of a lack of transparency processes, ABALOBI also does not base its practices on independent auditors in processes that should prove the traceability of SSF products, as the MSC also facilitates. However, the MSC might also have less reach and local accessibility than ABALOBI. A further assessment of these complementing aspects of the MSC and ABALOBI might also prove valuable in their actual applicability. This also aligns with the expert attitudes surrounding the general applicability of non-state approaches, as governance should not be attempted to be solved through only one non-state

approach but rather by complementing the facilitative capacities of multiple non-state approaches. Still, as defined by the experts, critical reflection must also occur to ensure that the number of tools does not overcomplicate the daily activities.

Indeed, the importance of state and non-state approaches complementing each other was also defined in the GFCM 2030 Strategy and the RPOA-SSF. This was also acknowledged by the MiPAAF, as the comprehensive improvement of the fishing industry relies on strengthened connections and interactions between fishing activities and the broader productive and social structure, encompassing linkages among landing sites, local markets, and the various stages of marketing, processing, and preservations (Spagnolo, 2011). Still, international state authorities' intentions (or the capability of following up on them) seem to be mainly considered with skepticism by Italian fishers (Raicevich, Grati, et al., 2020). Percy & O'Riordan (2020) also suggest that the CFP has long contained similar remarks regarding the recognition of SSFs. According to them, "fine words" relating to the situation of SSFs are rarely followed up on, and SSFs are easier ignored in comparison to LSFs, which is not just a flaw of decision-makers but also of scientists and a global, rather than an Italian or Mediterranean challenge. Multiple experts also addressed the mistrust of SSF operators in the multi-level information system. This, accompanied by the differing ideologies and discourses, indicates the necessity not only to overcome expected informational challenges but also to effectively follow up and promote efforts of the CEG system to do so.

The relationship between informational challenges impacts the multi-level information system's state and non-state support reform. However, CEG and non-state IG principles can complement each other, affecting reform most effectively. Non-state IG approaches offer facilitative capacities that are not yet present in the multi-level information system or that are present but lack effectiveness. Utilizing the facilitative capacities, as well as overcoming shared and unique informational challenges in CEG and non-state IG efforts, will most likely prove to be crucial in the reform of the information system. Without these steps in reforming the information system, it seems likely that the contextualization of regulations and co-management of Italian SSFs will never effectively occur. As such, the system is faced with the need to overcome challenges and the challenge of exploring novel approaches. In turn, this also desires a willingness to anticipate challenges that have not been considered before, if efforts to increase legal, reported, and regulated Italian SSF activities are genuinely valued.

9.5 Research Limitations

This thesis was based on specific theoretical steps applied in a complex marine governance case. As such, the research had to follow a path no one had traveled before, resulting in many new insights. Still, due to the novelty of this conceptual approach, some limitations were encountered that might have limited the research efforts and objectives. This section addresses these limitations to allow future research efforts to be performed with more efficient steps in this unique and exciting conceptual path.

The exploration of non-state approaches was mainly focused on Italian approaches, after which non-state approaches from other GFCM Member States were explored. It was assumed that states with a relatively higher proportion of SSF vessels in their total fishing fleets would also be more likely to have literature associated with introducing non-state approaches intended to improve the recognition of SSFs in governance processes. However, it became apparent that very little literature could be found on SSF governance, in general, in non-European (GFCM Member) States. It might be that the inventory of non-state approaches would have benefited from a focus on European (Member) States alone. Indeed, the selected countries of the Syrian Arab Republic, Lebanon, and

Tunisia also have relatively lower GDPs per capita. Notably, according to Melnychuk et al. (2017), the GDP per capita significantly affects the effectiveness of a state's fisheries management system. Still, following the notion of Langhorne (2005) that non-state approaches come to play significant roles in crises when they lie beyond the control of state authorities, it might be that the governance systems in these states also limit non-state approaches in their general applicability (Ramírez-Monsalve et al., 2021), due to various reasons that desire further research. Indeed, it is recommended that the GFCM assesses and reviews these countries' capacity to follow up on the RPOA-SSF and GFCM 2030 Strategy. This could be part of a broader consideration of how the identified informational challenges could limit efforts to contextualize regulations and facilitate co-management in other GFCM member states.

During the research, many organizations were identified that affected Italian SSF governance. This research has exhaustively attempted to present the most relevant parties. Many actors have also been approached, but many have not responded to the interview invitation. Multiple state authorities responsible for formulating regulations (such as DG MARE, AGRIFISH, MiPAAF, etc.) also did not respond to requests for interview participation. Still, many experts associated with institutions in the information system were interviewed. It is considered that these experts were better equipped to address the challenges in the provision of knowledge and information on which to base the contextualization of regulations. However, more state authorities' participation could have added insights into the informational challenges of translating enhanced and novel received information and knowledge to more effective and contextualized regulations.

Despite considerable efforts to arrange an interview with one of the representatives of ABALOBI, involving month-long discussions to find a suitable time, no interview could be scheduled. Insights from such an interview would have been valuable for identifying the facilitative capacities and informational challenges ABALOBI considered concerning reforming the multi-level information system in Italian SSF governance. This value would have been especially considerable, as the academic literature on the activities of ABALOBI was considerably less abundant than the literature on the activities of the MSC. The initial research design prioritized interviews with representatives of the selected non-state approaches before conducting interviews with other experts. This approach aimed to facilitate a more concrete discussion of their characteristics. Still, the literature found could effectively be related to the insights on the applicability of ABALOBI that other interviewed experts shared.

The research design aimed to provide a general exploration of the effects of a broad range of potential informational challenges in reforming the information system through CEG and non-state IG approaches. The semi-structured approach of the interviews complemented this by allowing experts to define informational challenges. However, it did not clarify whether these challenges were perceived to be exclusive to a CEG system or applicable to non-state approaches relying on the principles of IG. An example can be found in the statement that "the lack of collective capacity limits co-management". Such statements were pooled and discussed with other informational challenges, as shared challenges in *Chapter 8*, when other statements (of the same or other experts) concerned the same theme and were already related specifically to non-state IG or CEG.

While designing the interview guides, it was considered to define the difference between a non-state actor that relies on principles of IG and one that meets the informational pulling mechanisms of CEG. However, the choice was made not to overcomplicate the interviews and to assess how the participants would define the role of non-state approaches themselves. While this allowed for a further understanding of the role of non-state approaches in the CEG of Italian SSFs, it might have limited a practical expert assessment of the general applicability of non-state approaches that rely on

principles of IG. As such, the results presented in *Sections 7.3 and 7.4* also desired an extra reflection of the researcher on whether the expert discussed the role of a non-state approach meeting the informational pulling mechanisms of CEG or one that relies on principles of IG. This might have limited a credible reflection of some of the experts' attitudes.

Organizations were also identified that had an effect on the governance of Italian SSFs but were not actively engaged in the governance processes and, thus, had limited capacity to provide answers to the interview questions. For example, such a likelihood was identified with the International Union for Conservation of Nature (IUCN). They provide international guidelines and non-binding recommendations for sustainable fisheries governance, which often significantly influence the decisions of EU member states despite not actively participating in regulatory processes (IUCN, 2020a; Simard et al., 2014). Furthermore, MedPAN (Mediterranean Network of Marine Protected Areas Managers) was contacted for an interview (MedPAN, n.d.). However, they noted that "while MedPAN has some experience working with SSF stakeholders and policies, it is limited to MPAs-related activities". AKTEA was also invited for an interview (AKTEA, n.d.) to gain more expert insights on the role of women in the Italian SSF industry, but they did not respond. These are examples of actors that might have more valuable insights to share for the assessment of informational challenges about the contextualization of regulations that relate to their specific missions. However, the holistic nature of this research has possibly limited their interest or capacity to participate.

Some of the interviewed experts were also authors of utilized literature. The presentation of biased results was mitigated by constantly attempting to triangulate interview insights with literature that different experts wrote. Furthermore, the interviews that were performed in writing and via voice recording did not allow for an effective provision of clarification of the questions or requested clarification of the given answers. In turn, this led to some answers that could not be effectively linked to the research concepts and limited the insights that could be gathered.

Some experts shared experiences and informational challenges encountered in different Mediterranean countries. While it seemed reasonable to assume that similar situations could be characteristic of Italian SSF governance, these insights were omitted from the presented results. As the challenge of SSF governance is very much a Mediterranean one, it could prove helpful in future research to analyze other Mediterranean informational challenges, too, in approaches to aid international discussions to facilitate more effective recognition of Mediterranean SSFs.

It might have aided the identification of more specific informational challenges if experts had provided some short background info on the ABALOBI and the MSC's PSP before the interviews took place. Multiple experts were unaware of ABALOBI, limiting the possibility of discussing its applicability. Likewise, most experts seemed to respond to the application of the MSC based on their knowledge of the standard certification process. This showed a low awareness of the MSC's updated approach toward SSFs and that experts shared critical notes that seemed more related to the efforts toward LSF. Indeed, this critical perception toward the MSC has also been defined as an informational challenge. However, the research might have benefited if experts had a prior knowledge of the MSC PSP, as it would have allowed for the identification of more specific informational challenges that can be expected in the application of the program the MSC developed to interact with SSFs. Furthermore, expert attitudes also seemingly changed during the interviews when the researcher explained the concept of the MSC PSP. Still, due to their busy schedules, it was also considered that not much preparation could be expected from the interviewed experts.

9.6 Future Research

The research objective of this thesis has been achieved. Namely, it contributes insights into the informational challenges that could arise in enhanced IUU governance focused on recognizing and including SSFs. In turn, it also identifies how challenges affect state and non-state-supported reform of the multi-level information system to facilitate the contextualization of regulations on the one hand and co-management of Italian SSFs on the other. Indeed, commonalities and differences in these effects have been addressed, and a considerable basis for future research has been provided.

Part of this research might be worth spending more directly assessing the perceived severity of informational challenges. In this thesis, no experts were asked to reflect on informational challenges per group of information flows presented in *Chapter 6* (i.e., challenges in data collection, assessments and advice, and representation). Rather, experts shared the first informational challenges that came to mind, of which most could be directly pooled into one of these groups. Indeed, this allowed for a broad inventory of expert-identified informational challenges, and the higher frequencies of some shared informational challenges could indicate which challenges should be addressed with the most priority by decision-makers. However, it might prove valuable if future research takes the presented insights to explore such valuation more effectively with the practical objective of enhancing governance. This could be pursued by directly asking experts: 1) which of these three information flows would be associated with the most informational challenges; 2) which informational challenges identified in this thesis would have the most impact on the reform of the information system; and 3) exploring solutions for those most considerable. The same could be done for the informational challenges identified in non-state IG's applicability. This will lead to a final comparison of which of these two paths would be considered most radical when considering the informational challenges that must be overcome in either state- or non-state-supported information system reform. This could allow for a more concrete valuation of whether state-supported reform of the information system can be considered the least radical approach toward recognition of Italian SSFs, as Song et al. (2020) suggest, while it might also strengthen the notion proposed in this thesis that the informational challenges stemming from non-state supported reform can seem quite acceptable in comparison with those expected in the reform through a state-supported reform.

When future research efforts would like to build on the insights of this thesis, more participation of Italian SSFs in the research process would be valuable to pursue. Multiple local CO.GE.PA, local fishers, and MPA managers have been invited to participate in the interviews but reaching them digitally and by phone was particularly challenging. While the attitudes of SSF operators can be considered represented through the research participation of experts associated with multiple national and international fishery representatives, the direct participation of fishers or local organizations could prove valuable, especially as multiple experts expressed that the representation of Italian SSFs should improve. This would also allow for a better understanding of how this could improve and the informational challenges that should be expected. However, and most importantly, the recognition of Italian SSFs in governance processes is proposed in this thesis to stand central in efforts to reduce IUU practices through better consideration of local circumstances. Furthermore, it has been identified that the reform of the information system will likely also increase the necessary involvement of Italian SSFs in data collection and stakeholder involvement processes. Thus, it is most reasonable to ensure Italian SSFs have a voice in indicating to which extent this participation can be expected without creating a situation where demands surrounding data provision to aid the recognition of their existential threats result in novel threats from more governance pressure, be it either from CEG or non-state IG mechanisms.

10. Conclusions and Recommendations

The recognition of Italian SSFs in multi-level governance processes is considerably limited in the CEG system. Considering the generally perceived ineffectiveness of the multi-level information system in facilitating contextualized regulations and co-management of Italian SSFs, it seems quite unlikely that the current state of this system will allow for an effective increase of legal, reported and regulated SSF activities through better CEG recognition of their multi-specific particularities. Indeed, they typically operate near the coast with low-power engines and passive gear and are often run by individuals or small families. Furthermore, their practices hold significant cultural significance in local communities, and socio-economic threats in the form of little market power, competition with other fishing fleets, and low generational turnover generally face them. Still, considerable differences can be observed at the sub-national and local levels, challenging their effective multi-level recognition. More importantly, their existential threats can also be largely related to how they are recognized in multi-level governance processes, emphasizing the need for the effectiveness of these processes.

Increasing this effectiveness necessitates overcoming informational challenges in enhancing current and endorsing novel information flows. Notably, the information challenges did not differ considerably between implementing contextualized regulations and co-management of Italian SSFs. At the same time, differences were observed in the relation between CEG and non-state IG to provide support in these processes. The current information flows of the CEG information system, associated with data collection, representation, assessment, and advisory processes, were reflected upon by experts based on informational challenges that would be present in their enhancement rather than their replacement. Experts shared a positive attitude toward the general application of Mediterranean non-state approaches, specifically of the MSC and ABALOBI, in aiding the facilitation of more contextualized regulation and co-management of Italian SSFs. The associated novel information flows of non-state IG were considered to provide facilitative support to the current information flows in the multi-level information system and other facilitative capacities that were not discussed in relation to those of this system. Informational challenges were also defined in how the institutions in the multi-level information system perceived and validated the credibility of non-state approaches and the legitimacy of their data. The research has indicated that the radicality of reform of the multi-level information system might be just as considerable in enhancing the current information flows as validating novel ones. In fact, it has been made apparent that many expected informational challenges can even be considered shared challenges between CEG and non-state IG. Moreover, some of them were even expected to be mitigated by applying non-state IG.

The socio-ecological story of Italian SSFs deserves recognition. It is currently impeded by an immensely complex, multi-level governance and information system. The general challenge follows a relatively simple principle much akin to that of the game “Telephone” that kids play on the playground, where a message must be carried forward in a line by whispering it in the ear of each neighbor. When a long line of CEG institutions is necessary to understand the local particularities of Italian SSFs, it follows logically that, somewhere along the line, the initial message gets diluted, forgotten, or misinterpreted. However, unlike this kid’s game, multi-level state authorities can enhance the effectiveness of information flows in the current system while also being able to invite new players (i.e., non-state approaches) to the ring that could aid the transfer of the initial message to the last player in the line (i.e., decisionmakers). Indeed, while inviting new players to the CEG information system would desire extra emphasis on the alignment of applied methodologies and validation of credible activities, the facilitative capacities of non-state IG should not be ignored in attempts to aid the recognition of Italian SSFs through more contextualized regulations and co-

management of Italian SSFs. No one-size-fits-all non-state approach or the replacement of the structure of the CEG system should be pursued. Rather, the multi-level strengths and weaknesses of state and non-state approaches must be explored, understood, and considered in light of each other to ensure the increase of legal, reported, and regulated Italian SSF activities. Ultimately, this would directly benefit the guidelines in the GFCM 20230 Strategy and the RPOA-SSF and could provide a basis for reproduction in other GFCM Member States.

While this research has provided an extensive list of expected informational challenges in the necessary reform of the multi-level information system to enhance current information flows and novel information flows, experts also emphasized that the recognition of Italian SSFs follows from overcoming a willingness to change the current multi-level information system. While international and national state authorities have already expressed interest in supporting non-state approaches, effectively executing this is not a given, and some receive it with skepticism. This skepticism seems to mainly stem from generalized convictions of the credibility of non-state approaches in supporting information flows of the CEG system.

Still, the facilitative capacities of non-state IG have been broadly inventoried and only desire the anticipation of informational challenges provided in this thesis. More specifically, the facilitative capacities and informational challenges of the MSC and ABALOBI were considered in this research by experts, which resulted in an overview of opportunities and weaknesses that should be considered by their representatives, as well as the multi-level state authorities. These considerations can possibly take place most effectively between these non-state approaches and authorities in the multi-level CEG information system to evaluate the option of necessary state and non-state adjustments to allow for more effective integration and validation of novel information flows. The Friends of the SSF Forum of the GFCM might provide a beneficial initial platform for these discussions. Furthermore, many interviewed experts play essential roles in the multi-level CEG information system. Following the research results, it stands to reason that these experts would have something to gain in personally engaging with the MSC and ABALOBI to assess whether their current knowledge meets their actual activities and how these non-state approaches could aid their own activities. Lastly, it should be recognized that the MSC and ABALOBI were only two non-state approaches in a sea of IG opportunities.

The author hopes that all actors in the multi-level information CEG system feel enthused and motivated to explore this sea themselves, too, without limitations in the form of general convictions and with the acknowledgment that ICT is continuously developing. These developments could be ignored with the belief that novel approaches bring novel challenges. However, the challenges might be just as considerable when maintaining the status quo and ignoring the additional value of utilizing novel approaches.

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Appendix I: Interview Blueprint

The development of the interview guides in *Appendix II* followed a process that considered steps to ensure the interview data was relevant, objective, and credible. According to Kallio et al. (2016), five steps could be followed to ensure this. These steps were as follows:

1. Determine the condition for using semi-structured interviews.
2. Utilize existing knowledge to develop an interview guide.
3. Create a preliminary interview guide.
4. Test the interview guide through a pilot study,
5. Use the final version of the interview guide

Objective of Interviews

To gain insights into the attitudes of experts in Mediterranean or Italian SSF governance regarding the effectiveness of the multi-level information system and the necessary reform to enhance the recognition and inclusion of Italian SSFs in governance processes. The experts needed to consider the application of select non-state approaches and list informational challenges that can be expected in reforming the current multi-level information system with CEG and non-state IG. Lastly, representatives or experts on the selected non-state approaches were also approached for interviews. However, additional questions were formulated to better understand the approaches and how they relate to the multi-level information system in the governance of Italian SSFs (see version 2 of the interview guide in *Appendix II)*.

Overarching Interview Research Questions

To meet the objective, interviews were conducted to answer specific questions. These questions also provide a framework for deciding the codes for analyzing patterns (as discussed in *Section 3.6*).

1. *What are the attitudes of experts toward* ***the effectiveness of the current multi-level information system in recognizing and including Italian SSFs?***
2. *Which informational challenges do experts expect in reform of the multi-level information system to facilitate co-management and contextualization of regulations,* ***with CEG?***
3. *Which informational challenges do experts expect in reform of the multi-level information system to facilitate co-management and contextualization of regulations,* ***with non-state IG?***
4. ***Would experts perceive the MSC and ABALOBI as credible in facilitating more contextualized Italian SSF regulations and co-management of Italian SSFs?***
5. *What informational challenges do experts expect in reforming the multi-level information system to legitimize* ***the MSC and ABALOBI as tools to facilitate co-management and contextualization of regulations?***

Formulation and Structure of Questions

The method for deciding the question sequence and formulation followed from the research of Roopa & Rani (2012). With that, the questions became more specific as the interview continued, and more personal and intimate questions were asked at the end. Interview participants were selected explicitly with the expectation that they would be able to grasp the meaning behind utilized terminologies. If not, the interviews were structured to allow for sufficient time to clarify words. The following criteria of Roopa & Rani (2012) were considered while creating the questions:

- The questions should be clear and comprehensible.
- They should be uncomplicated and straightforward.
- Each question should focus on one idea or concept only.

- The questions should be specific and aligned with the possible respondent's thought process.
- Ambiguous words should be avoided in the questions.
- Words that may trigger emotional responses should be avoided.

Testing of the Interview Guide

Kallio et al. (2016) suggested a pilot study of the interview guide. For efficiency purposes, no pilot study was performed. Instead, the final versions of the interview guides were assessed with fellow students of the master's program. This way, a reflection took place on some of the criteria of Roopa & Rani (2012) in determining the effectiveness of a questionnaire. This research considered that these criteria also allowed for a practical reflection to ensure credible and objectively phrased interview guides. These were as follows:

- The questions are appropriately formulated.
- The phrasing of the questions is designed to produce the intended outcomes.
- The questions have been arranged in the optimal sequence.
- The questions are comprehensible for all participants.
- No questions are unnecessary.
- The instructions are sufficient for logical responses.

Appendix II: Drafts of Interview Guides

Version 1: Interview Guide all Experts

Introduction
The interview is intended to gain more insights into the governance processes and how you reflect on the application of selected non-governmental approaches to improve Italian SSF governance. As discussed, your expertise will probably allow more discussion of European SSF governance, which is already very valuable. With your help, informational challenges that limit the effectiveness of governance and non-governmental approaches to facilitate co-management and the formulation of more contextualized regulations of Italian SSFs can also be defined. All insights will be synthesized into recommendations for policymakers to support the GFCM 2030 Strategy and RPOA-SSF to improve the governance of Italian SSFs.

Relevant Matters for the Interview:

- I would like to record the interview.
- Do you consent to your name and organization being referred to in the report?
- I would like to send back the interview transcription so that you can assess whether it correctly reflects what has been said.
- Any questions?

General Questions

1. Can you tell a little bit about yourself and your background?
2. What role do you and your organization play in the governance of (Italian) small-scale fisheries?

Specific Questions

3. In your opinion, are current multi-level regulations sufficiently based on information considering the socio-ecological characteristics of all European small-scale fisheries?
4. In your opinion, should the current institutions providing information to governmental organizations change their way of working to create more contextualized regulations?
5. Would you say that non-governmental approaches or organizations (market or fishery initiatives, for instance) are needed to reach more contextualized regulations?
6. Can you mention such non-governmental approaches or organizations?

Literature seems to indicate a growing number of Italian co-management schemes, where Italian small-scale fisheries are endorsed by the government to perform activities of self-reporting and self-control, in support of governmental objectives. This can be found in examples such as Local Management Plans (LMPs), Territorial User Rights for Fishing (TURFs), Fishers Local Action Groups (FLAGs), Local Governance Groups (LGGs from WWF's and MEDPAN's FISHMPA Blue projects). The European Parliament has adopted a motion in May of 2023 that requests the European Commission to develop a non-binding voluntary regulatory framework on fisheries co-management, and to assess how these models can be encouraged and facilitated.

7. What do you perceive as necessary changes for the European parliament's desired transition to take place?

8. Would you say that non-governmental approaches or organizations (market or fishery initiatives, for instance) are needed to facilitate co-management?
9. Can you mention non-governmental approaches that can help with the facilitation of co-management schemes?

The Marine Stewardship Council (MSC) is an organization that sets standards for sustainable fishing practices. They certify fisheries that meet their criteria, which can benefit small-scale fisheries by providing recognition and market access for their responsibly managed fish stocks.

10. Would you consider the MSC as a credible program to legitimately provide information on socio-ecological characteristics of (Italian) small-scale fisheries?
11. What could be challenges for the MSC to provide support to governance processes for more contextualized regulations?
12. What could be challenges for the MSC to facilitate co-management schemes that is endorsed by multi-level governance organizations?

ABALOBI is a digital platform and mobile app that provides small-scale fisheries with tools for self-reporting, self-control and to aid sustainable resource management, traceable seafood supply chains, and access to markets, based on means of transparency in the fishing industry.

13. Would you consider ABALOBI as a credible program to legitimately provide information on socio-ecological characteristics of (Italian) small-scale fisheries?
14. What could be challenges for ABALOBI to provide support to governance processes for more contextualized regulations?
15. What could be challenges for ABALOBI to facilitate co-management schemes that are endorsed by multi-level governance organizations?

If Time is Left

16. How do you see the future of the European small-scale fisheries?
17. More on the practical side: is there anyone you would recommend me interviewing on this subject?

Thank the interview participant for their time.

Version 2: Interview Guide experts of Selected Non-state Approach

Introduction
This interview is intended to gain insights into the specific way of working of [the MSC or ABALOBI] and how it could aid the facilitation of co-management and the formulation of more contextualized regulations of Italian SSFs. With the help of the interviewee, informational challenges will also be defined concerning the interaction between the current multi-level information system in the governance of Italian SSFs and ABALOBI SSFs. All insights will ultimately be used to synthesize answers into recommendations for policymakers and practitioners to support the GFCM 2030 Strategy and RPOA-SSF.

Relevant Matters for the Interview:

- I would like to record the interview.
- The research results will be anonymously referred to in the interviews. Do you consent to your name and organization being included in a list of interviewees in the report?
- I would like to send back the interview transcription so that you can assess whether it correctly reflects what has been said.
- Any questions?

General Questions

1. Can you tell a little bit about yourself and your background?
2. What role do you and your organization play in the governance of (Italian) small-scale fisheries?

Specific Questions

3. In your opinion, are current multi-level regulations sufficiently based on information that considers the socio-ecological characteristics of all Italian small-scale fisheries?
4. In your opinion, should the current institutions providing information to governmental organizations change their way of working, or is there more information needed to create more contextualized regulations?
5. Can you mention non-governmental approaches (market or fishery initiatives, for instance) that can aid the recognition and inclusion of Italian SSFs, outside of [the MSC or ABALOBI]?

Literature seems to indicate a growing number of Italian co-management schemes, where Italian small-scale fisheries are endorsed by the government to perform activities of self-reporting and self-control, in support of governmental objectives. This can be found in examples such as Local Management Plans (LMPs), Territorial User Rights for Fishing (TURFs), Fishers Local Action Groups (FLAGs), Local Governance Groups (LGGs from WWF's and MEDPAN's FISHMPA Blue projects). The European Parliament has adopted a motion in May of 2023 that requests the European Commission to develop a non-binding voluntary regulatory framework on fisheries co-management, and to assess how these models can be encouraged and facilitated.

6. What do you perceive as necessary changes for the European parliament's desired transition to take place?
7. Can you mention non-governmental approaches that can help with the facilitation of co-management schemes, outside of [the MSC or ABALOBI]?

Applicability of [the MSC or ABALOBI] in Facilitating Recognition and Inclusion of Italian SSFs

8. How would you see [the MSC or ABALOBI] credibly providing information on socio-ecological characteristics of Italian SSFs to aid the contextualization of regulations?
9. How would you see [the MSC or ABALOBI] facilitating co-management of Italian SSFs that is endorsed by governmental organizations?
10. How do you see the current attitude toward [the MSC or ABALOBI], by all stakeholders as a tool for recognizing and including Italian SSFs in multi-level governance processes?
11. Which characteristics of [the MSC or ABALOBI] do you see as enabling widespread application of the program by Italian SSFs?
12. Which characteristics of [the MSC or ABALOBI] do you see as limiting widespread application of the program by Italian SSFs?

If Time is Left

13. How do you see the future of the Italian small-scale fisheries and the development of IUU governance?
14. Do you think we have missed anything interesting, during the interview?

Thank the interview participant for their time.

Appendix III: Consent Form Interview Participants

Project Title: The potential of Mediterranean non-state approaches in light of IUU fishing

Consent for Inclusion in the Dissertation
The purpose of this consent form is to seek your permission to include your name, organization, and the insights you shared during the interview in the final dissertation. I want to ensure that your contributions are accurately and respectfully represented in my findings.

Options for Inclusion:

1. **Anonymous Option:**
    - If you choose the "Anonymous" option, your name and role within your associated organization(s) will be disclosed in the dissertation, but your insights will be presented in an aggregated, non-attributable manner. You will be referenced on the basis of your unique interview participant number. An example (not based on actual findings) of this form can be found below.

    "Five interviewed experts shared the attitude that the MSC can aid contextualization of SSF regulations (1,5,6,7,12). Four experts explicitly mentioned that it can increase the amount of credible data (1,6,7,12). However, three experts also expressed the notion that data should only be collected by state-appointed research centers and that non-state approaches should never play a role in this.".

2. **Reference by Name Option:**
    - If you choose the "Reference by Name" option, your name and role within the associated organization(s) will be disclosed in the dissertation. Furthermore, your insights can be presented with a reference to your name and date of the interview. Rest assured that I will handle this information with utmost professionalism.

Your Decision

☐ **Anonymous:** I am comfortable with my name and organization being mentioned in a list of interviewed participants but prefer that they are not mentioned in relation to specific quoted insights. I agree to have my insights presented anonymously.

☐ **Reference by Name:** I am comfortable with my name and organization being mentioned in the dissertation alongside the insights I shared during the interview.

Confirmation:

By selecting one of the options above, you confirm that you have read and understood the purpose of this consent form. Your decision is entirely voluntary, and you have the right to withdraw or change your consent at any time. If a response has not been received by the 23rd of January 2024, I will assume your preference for anonymity.

Please sign below to indicate your consent:

Name:
Date:

Signature: