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Challenges for implementation of the FAO's Voluntary Guidelines for Securing Small-scale Fisheries. A case study of Small-Scale fisheries governance in India.

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Abstract.

For years, small-scale fisheries were marginalized until this sector gained international recognition after the FAO's voluntary guidelines for securing SSFs were endorsed in 2014. Since then, there has been active research, especially in developing countries, to implement these guidelines.

Small-scale fisheries that are diverse, complex, and dynamic are challenging to govern and require a transformed governance system to govern and implement the guidelines. This study builds upon the interactive governance theory to look for gaps in both the system-to-be governed and the governing system in Indian Fisheries. System- to- be- governed and the governing system characteristics are analysed on diversity, complexity, dynamic, and scale. Thus, by this analysis, obstacles are identified in both the systems, which suggests reforms in the Indian governing system to secure small-scale fisheries as per the goal of FAO voluntary guidelines.

Overall, the study indicates that the Indian small-scale fisheries are difficult to be governed and how strengthening the governance system in the Hierarchal mode can benefit SSFs in India.

Keywords: Small-scale Fisheries, FAO Voluntary Guidelines, Interactive Governance.

Contents

- Acknowledgments 2
- Abstract..... 3
- List of Tables 6
- 1 Introduction 1
 - 1.1 Research Questions 3
 - 1.2 Structure of the thesis 3
- 2 Theoretical Framework..... 4
 - 2.1 The governance concept and Interactive Governance. 4
 - 2.1.1 Governability 4
 - 2.2 Interactive governance concept..... 5
 - 2.2.1 System-to-be-Governed..... 6
 - 2.2.2 Governing system..... 6
 - 2.3 Characteristics of governance; Diversity, complexity, dynamics, scale. 7
 - 2.4 Orders of Governance..... 8
 - 2.4.1 First Order Governance. 8
 - 2.4.2 Second Order of Governance..... 9
 - 2.5 Modes of governance. 11
 - 2.5.1 Hierarchal governance..... 11
 - 2.5.2 Co- governance 11
 - 2.5.3 Self-governing:..... 11
 - 2.6 Methodology 12
 - 2.6.1 Data Collection 12
 - 2.6.2 Data Analysis 12
- 3 Presentation and description of some of the characteristics and attributes in the system-to-be-governed in SSF in India 14
 - 3.1 SSFs in India 14

3.1.1	Defining SSF in India.....	15
3.2	Examples of high diversity – the diverse combination in terms of species, craft and gear in SSFs.....	16
3.3	Examples of High complexity, diversity and scale- Market for small-scale fisheries.	19
3.4	Example of a dynamic and ungovernable Attribute - Climate change.....	20
3.5	Examples of Complexity	21
3.5.1	Overcapitalization and overexploitation.....	21
3.5.2	Poor Social conditions of Indian Small- Scale Fishers.	22
4	Presentation and description of some characteristics and attributes of the Governing system for SSF in India.....	25
4.1	Modes of Governance-Governing structure of Indian Fisheries.....	25
4.1.1	Examples of Hierarchal governance Central/federal-government policies.	25
4.1.2	Five-year plans.....	26
4.1.3	CMFP (Comprehensive Marine Fishing Policy 2004.).....	27
4.1.4	Deep sea policy and Trade policy.	27
4.1.5	State’s government policies: -.....	28
4.1.6	Examples of self-or co-governance Local Level Governance system (Panchayats)	30
4.2	Attributes of Governing system.	31
4.2.1	Diversity in Governing system	31
4.2.2	Complexity in Institutional nestedness and scale.....	32
4.2.3	Institutional dynamics and scale Issues.	33
4.3	Gaps Identified in the Governing system	34
5	The FAO voluntary guidelines.	36
6	Discussion	39
6.1	Obstacles observed in the Governing system.	39
6.2	Reforms required in the Governing system.....	41

6.3	Limitations & Recommendations.....	42
7	Conclusion.....	43
	References.....	44

List of Tables

Table 1.	Popular fish species and gear state wise.....	18
Table 2.	Overcapacity in fleet.....	22
Table 3.	Marine Fishing Regulation Act.....	29

List of Figures

Figure 1.	Interactive Governance model.....	6
Figure 2.	Orders of Governance.....	9
Figure 3.	Map of India Showing EEZ and maritime states.....	15

1 Introduction

Small-scale fisheries have been marginalized and unrecognized for years despite their significant contribution to the world fisheries in food security, nutrition, livelihood, and local and national economies. SSFs are the most vulnerable socio-economic groups as they are solely dependent on marine resource harvesting. SSFs play a vital role in world fisheries as in the year 2012, of 120 million involved in capture fisheries, 90% of them were small-scale fishers. SSFs are even more critical in developing countries where over half of the fish catch is from SSFs (FAO 2020).

From the 1950-70s, the fishing industry's focus was on strengthening the large-scale fisheries with an emphasis on the development of fishing effort and capacity. From then on, small-scale fisheries were considered inefficient and was largely ignored by the authorities in many countries. It was assumed that this sector would merge into large-scale fisheries and thus gradually disappear (Kurien 1998). However, despite this political marginalization, the small-scale fisheries managed to survive independently. Pressure on the fisheries resources were from the industrial fisheries, led in the 1980s to acknowledge small-scale fisheries as sustainable user of the resources. This also triggered a shift of fisheries policies from development in efforts and capacity to sustainable fisheries. Although there were goals in the code of conduct of responsible fisheries in 1995 for SSFs, which the fishers organizations were dissatisfied with, it almost took 20 years when the SSFs were given recognition on a global level when the SSFs guidelines by the committee of fisheries (COFI) of FAO were endorsed in 2014 (Carvalho, Edwards-Jones, et al. 2011, p.361).

9th June 2014 marks an important date for around 23 million fishers worldwide when the committee of Fisheries (COFI) of FAO endorsed the Voluntary Guidelines for Securing Small-Scale Sustainable fisheries in the context of Food Security and poverty eradication (FAO 2020). This was the first-ever when any International instrument was adopted for this sector (Jentoft, Chuenpagdee et al., 2017). The guidelines are in the form of a document that guides the state and the stakeholders informing the policies, legal framework that would lead to responsible and sustainable small-scale fisheries. The guidelines aim to enhance the contribution of SSF to global food security and nutrition while also improving the socio-economic condition through sustainable fisheries management practices. The voluntary guidelines for securing small-scale fisheries focus on the human rights-based approach (HRBA) (Willmann, Franz et al. 2017).

Moreover, the guidelines aim to eradicate poverty and aim to encourage states and civil society organizations to improve the sustainability and viability of the SSFs. The guidelines do not only prescribe that SSF governance should provide fundamental human rights but also enhance SSFs participation in decision making. Implementation of the guidelines will make the fishers aware of their rights in terms of getting access to food, proper living standards, and decent working conditions.

The diversity and complexity of SSFs limit the implementation of the guidelines in fisheries policy. In addition to diversity and complexity, scholars such as Jentoft and Chuenpagdee have termed fisheries problems as wicked, without easy technical solutions to them. As stated by (Jentoft 2017), "the implementation of the guidelines would need reforms in policies and governance because as the guidelines put emphasis on the human rights and equity-based principles for the SSFs, interfere with the power relations among various stakeholders" (p.3). Therefore, it is essential to know the attributes of the countries' governing system where the guidelines must be implemented. As SSFs are diverse and complex in characteristics making them challenging to govern., it becomes essential to study the nature of the SSFs as a system to be governed and the governing system and how the two systems interact, affecting the governability. This is discussed in the Chapter-2.

India is a big fishing nation, where SSFs play a significant role in terms of food security. It is not possible to explore the whole fisheries in India in a master thesis. Therefore, this thesis's scope is to explore and describe the characteristics of both the SSF system to be governed and the governing system. As I will describe in Chapter 3, the SSF in India is characterized by diversity, complexity, and wickedness, and despite a well-established institutional system, the governability in the Indian fisheries may be low or at the best medium. Hence, the condition of implementing the voluntary guidelines for small-scale fisheries may be difficult. In this thesis, I will use the chosen elements from the exploration to discuss if these characteristics are obstacles to implementing the guidelines and if they indicate that there are obvious needs for reforms in the Indian governing system. As stated by (Song, Johnsen et al. 2018), governability assessment of whole systems is impossible, and therefore I limit my scope to a few descriptive research questions listed in 1.1.

1.1 Research Questions

1. Identify and describe the characteristics of dynamics, complexity, and diversity related to Indian SSFs.
2. Identify and discuss how these elements may represent obstacles to implementing the SSF Guidelines?
3. Do the answers of RQ a and b indicate a need for a reform in Indian fisheries governance?

1.2 Structure of the thesis

This thesis is organized into seven chapters such that chapter two is the theoretical framework that includes the Governance theory used in the thesis, and this chapter also includes the methodology. Chapter three describes the characteristics of the system-to-be-governed in the Indian context.

Chapter four presents the attributes of India's governance system; in this chapter, the attribute of governance with diversity, complexity, dynamic, and scale are discussed with the structure of the governance system. Chapter five describes the FAO voluntary guidelines. Here the objectives and the goals of the guidelines are discussed. Discussion is followed in chapter six, where the study's limitation is also presented, and chapter seven includes the conclusion.

2 Theoretical Framework.

The research questions in this thesis will be answered using governability analysis. In the following section I will define and explain the central concepts in that are used in a governability analysis and present the Interactive governance theory framework. The primary sources for the following theoretical framework are Kooiman, J. and M. Bavinck (2013). Theorizing governability–The interactive governance perspective In Theorizing governability–The interactive governance perspective. Governability of fisheries and aquaculture, Springer: 9-30, (Jentoft and Chuenpagdee 2015) Assessing governability of small-scale fisheries. Interactive Governance for Small-Scale Fisheries, Springer: 17-35 in "Interactive governance for small-scale fisheries." Global Reflections. Dordrecht, MA: Springer. This thesis is also inspired by the master's Thesis of Anna Efremova (2016) Arctic Governability: A wicked problem.

2.1 The governance concept and Interactive Governance.

2.1.1 Governability

The term governance has been used a lot since the World bank introduced the norm for Good Governance in early 1990, mainly with natural resource governance. Traditionally, Governance as a concept primarily encompassed the role of the government and what government do? It was primarily about governing. However, later the idea was broadened when institutions besides the state such as private enterprises, civic organizations, and the general public were also regarded as part of the governance process (Kooiman and Bavinck 2005).

Governance is defined by (Kooiman and Bavinck 2005), "Governance is the whole of public as well as private interactions taken to solve societal problems and create societal opportunities. It includes the formulation and application of principles guiding the interactions and care for institutions that enable them" (p.17).

Governance is more than governing based on the understanding that non-state actors, such as NGOs, individuals, voluntary associations, companies, international organizations, political parties, etc., are vital in Governance as the state actors (Kooiman and Bavinck 2005).

Governance is performed by the shared responsibility between all the actors involved. Kooiman developed this into what he calls the Interactive Governance (IG).

With the complexity, dynamics, and wickedness of the system in mind, governability is how well a governing system can cope with these challenges. The governability of a system depends on the governing system's characteristics, the natural and social system to be governed, and the interactions between them. Governability is about the governing system's capacity to solve problems and the governing system's characteristics, natural and social system-to-be-governed, and the governing interactions (Jentoft and Chuenpagdee 2015).

2.2 Interactive governance concept

Interactive governance concept as defined by (Kooiman and Bavinck 2013), "The whole of the interactions taken to solve societal problems and create societal opportunities, which includes the formulation and application of principles guiding those interactions and care for institutions that enable them" (p.11).

According to (Jentoft and Chuenpagdee 2015), "The **interactive governance** is the interaction between the two systems the governing system and the system to be governed. The interactions take place between the actors to remove obstacles leading to new pathways. The actors interact based on the structure they are functioning in, such as geography and ecosystems. Actors can be different departments, individuals, organizations whereas the structures can also be the culture, law, agreement on which the actors are rooted" (p.23).

The interactive governance perspective is used to look for the governance problems and the solutions within the system to be governed, the governing system, and the way the two interact. The governance takes place based on the interaction between the actors; that are the governance modes. Further, the governing activities are held in the governing orders and the modes of governance. The governing orders explain societal activities or social-political governors in terms of their activities, while governing modes aim at forms of societal interactions in which these activities take place.

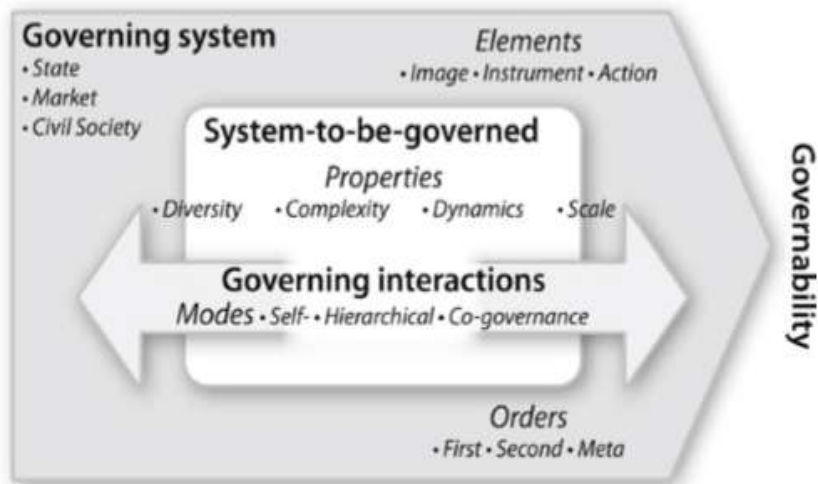


Figure 1. Interactive governance Model

Source: Interactive governance Model, “Reprinted from Governability of Fisheries and Aquaculture: Theory and Applications (p 13).”

2.2.1 System-to-be-Governed.

The system to be governed consist of both the humans and natural resource base, which is humans embedded in the nature system. Humans are dependent on the natural system, whereas the natural System is also affected by human-made changes that indirectly affect the system, such as climate change and overfishing (Kooiman and Bavinck 2013). For a balanced functioning of this system, there is a need for environmental ethics, social justice, and the precautionary approach (Kooiman and Bavinck 2013).

2.2.2 Governing system

A governing system is built up of mechanisms and processes to guide, control, and steer the system to be governed. In the interactive theory, three realms make up the governance system: state, market, and civil society.

The state is the central governing entity that is always present in the society, and it tries to play an influential role in the community. It is also the politics that keeps government goals in check by providing negotiations and establishment towards those goals.

Market also contributes to the governing process through different angles depending on the core discipline of the observer. Therefore, the market can be viewed by self-organized competition, or through competition and cooperation, or competition and power. Besides, markets have limitations such as market failures (Kooiman and Bavinck 2013).

Lastly, the civil society has non-profit organizations that make up its core together with academic institutions. Civil society plays an active role in channelizing societal activities to achieve governance goals; civil society can only positively contribute to the governing process, but it is criticized (Kooiman and Bavinck 2013).

2.3 Characteristics of governance; Diversity, complexity, dynamics, scale.

According to (Bavinck and Kooiman 2013), “Diversity, Complexity, dynamics and scale are the characteristics of the governing system and the System to be governed which explains the overall governability of the societal systems and there three components which is the System to be governed, governing System and the interactions taking place between the two systems. The analysis of these four features depicts the success and failure of the governing system” (p. 32).

In a broader sense, governance analysis can be performed on four parameters, which are (Diversity, Complexity, dynamics, scale, and boundary) in this whole System of the governing System and the System to be governed.

By *Diversity*, actors, species, interest, and images makeup both the system of governance. Both systems to governed and the governing system will be analysed on this parameter. In system to be governed with High diverse System would require varied governance approaches, whereas Low Diverse System to be governed can be met by using simple utaranian styles of governance. However, while dealing with the High diverse System to be governed is difficult compared to a less diverse system to be governed.

By *Complexity*, it is meant how the natural System interconnects, how species interact, and how a habitat contributes to the system's productivity. All these interactions take place in socio-economic systems with a variety of governance arrangements. Complexity can be studied at institutional nestedness, as explained by (Bavinck and Kooiman 2013). A system can be highly complex to govern when the institutions are nested at various levels and multi-level governance.

Dynamic

System to be governed and the governing system both experiences change with time; there are internal and external causes. The system to be governed experiences changes such as Climate change (e.g., temperature, weather patterns, etc.), whereas the governing system has dynamic characteristics such as alterations in stakeholder's composition. To deal with the highly dynamic system to be governed, the governing system should be flexible in terms of adopting to the system to be governed dynamic nature to increase governability.

Scale

Scale can be lower and higher based on the Ecosystem we deal with in the fisheries, as some species have only limited spatial range others are extremely large. Scales also vary in fisher operation and the markets. Such as fish chains operate at local markets where others operate at International parameters. Governability at a higher scale is complex and require varied approaches and styles of governance.

2.4 Orders of Governance

Governance can be divided into three different order, first, second and third (Kooiman Bavinck 2013). In this study the first and the second order governance are used.

2.4.1 First Order Governance.

The first order of governance occurs when the government and the society interact to solve the societal problems to find opportunities or solutions. The problems can include the problems in supply chain of the fisheries with issues in market, price, livelihood etc. The problems in the first order are in the day to day activities of the society. The goals here are identifying the problem and finding the solution to it and creating opportunities for society. In the interactive theory, the solution to these governance problems is shared responsibility between the government, market, and civil society to look for the solutions.

According to (Kooiman and Bavinck 2013), "In the first order of the governance the interactions takes place in two levels; international and structural level" (p.19). At the International level, there are three components, which are images, instruments and actions, while in the structural level, the components are culture, resources and power. For the effective governing, the three instruments; images, instruments, and actions are the conditions to be fulfilled.

The author also highlights that for the system to be governed by the governors they should know where the system to be governed is, where it needs to be and how the actual situation may be moved into the preferred condition. However, this system lacks the instruments where the system would be forced to required action

2.4.2 Second Order of Governance.

It is the second order of governance in which the first order's problem solving takes place in an institutional arrangement. Institutions define the rules, rights, norms, beliefs under which new laws are created, and the governing problems are solved, and the opportunity is created (Jentoft 2004). In addition to it, the second order of governance performs an analysis of the two dimensions 1. Capacity to govern 2. Quality of governance.

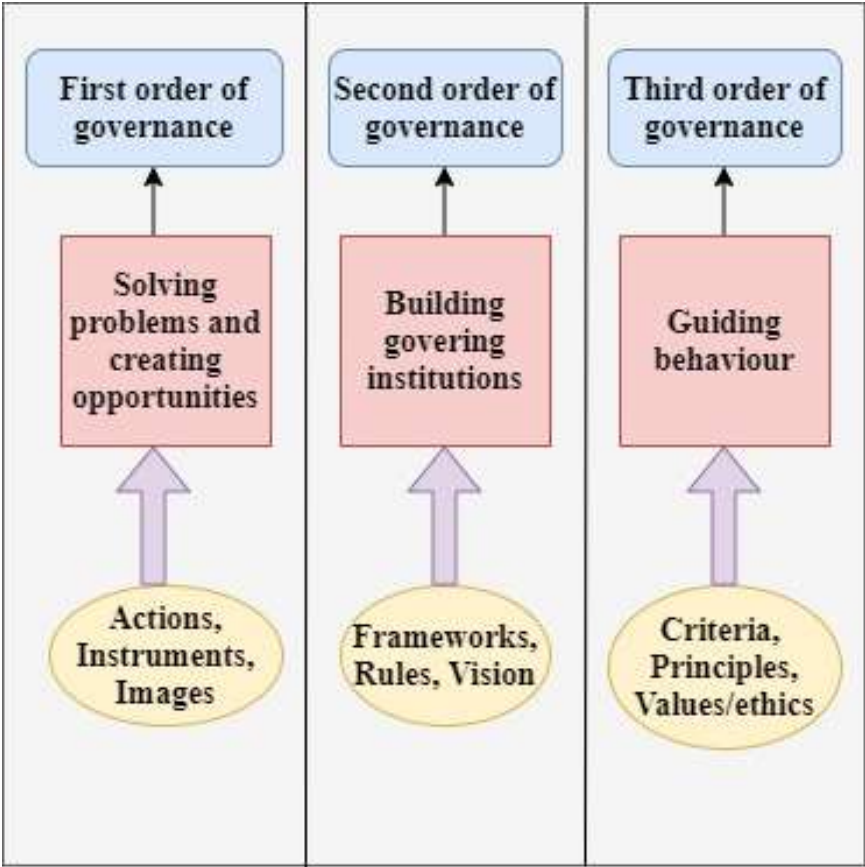


Figure 2 – Showing Orders of Governance on the elements they are build.

2.4.2.1 The Capacity to govern: -

The capacity to govern depends on the structure and function of the governing system and depends on the characteristics of the system to be governed. The governing system's capacity is the legal means it needs to enforce policies and the technical, physical, and human resources needed to govern on one side and the ability to enhance people's acceptance on the other side. It also depends on how well the governing system knows the system to be governed.

2.4.2.2 The quality of governance process: -

The governance quality is about the Good governance, which means whether the governance process is according to the set of agreed principles, with sticking to certain norms and values. It has to be noted that governability considers the instrumental goals and the normative aspects in the process. The quality and capacity are about how well the system is organized on one side and producing the expected outcomes on the other side. These two elements together create the legitimacy that is needed to achieve governability.

According to (Jentoft 2004), "Institutions in fisheries are based on three pillars which are *Regulative, Normative and Cognitive pillars*" (p.143).

The **regulative pillar** is based on the rules established in the fisheries. How are the rules established in the fisheries? How are the interest of various stakeholders held in it?. The regulative pillar depends upon the quality of the governing system. A country also runs on dictatorship; however, it is not a good governance. It is often observed that when the rules are not in favour of the interest group, they often do not comply with the laws, such as in SSFs.

Normative pillar

This pillar is based on the behaviour and values embedded in an Institution to reach the goal. This pillar is made up of the core values, which made the institution in the first place.

Cognitive Pillar

The Cognitive pillar is based on knowledge, which is fed back to the institution to make changes based on the learning.

Most of the fisheries management problems are based on the Institutional issues in the three pillars defined above. However, external problems could be outside the institution for its failure, such as legislation, research gaps, lack of resources, poor resource group organization, etc.

2.5 Modes of governance.

Based on the governing system's characteristics discussed above, diversity, dynamic, and scale, a best fit governing mode can opt. The governing system's needs and capacity are defined by the governing modes that are self-governing, co-governing, and hierarchical governance. The governance takes place at the modes of the governance. The governance in real-world takes place using the mix of all three modes of governance

2.5.1 Hierarchical governance.

This is the most common mode of governance which exists in fisheries governance. Here the state gets power is exercised in a hierarchical structure. The hierarchical governance exists in the different levels of the governments such as centre, state, local, and panchayats in India, a form of local government. The SSFs guidelines have made the national government responsible for the implementation. However, the hierarchical order of governance interaction is significant for the implementation process, leading to failures in the implementation of new policies where there is a complicated bureaucracy and legal pluralism

2.5.2 Co-governance

The governability in this mode is based on both the system's capacity to be governed and the governing system. According to (Jentoft and Chuenpagdee 2015), "co-governance is synonymous with co-management where institutional matters are involved. This mode of governance enhances the issues in governability at the scale and complexity parameters in the governance, which helps in the inclusion of stakeholder's participation, power-sharing and democracy" (p.29). However, this governance mode can cause multiple interactions in both the systems leading to higher complexity in governance and higher transaction costs

2.5.3 Self-governing:

In this mode of governance in SSF can govern themselves without any formal outer public authorities. Self-governance is a type of informal governance, although how beneficial it depends upon the capacity and the quality of the system to be governed. It is observed that the SSF is governed by institutions, as in cases such as tenure rights that the formal regulations

are required to secure the SSFs, if the interference is missing, which leads to the tragedy of commons. Diversity is highest in the self-governing mode as actors are independent in their choice. Moreover, this mode is also highly diverse, as this is the least formalized mode of governance.

2.6 Methodology

This thesis is primarily based on Theoretical Research by using Secondary data sources. The research approach is exploratory and descriptive, more than analytical. This is mainly because of the scale and complexity of the Indian fisheries sector. An important aim has been to identify characteristics and attributes. Concepts and schemes informed by the theoretical framework have been used to undertake a Qualitative analysis of documents and materials about India's fisheries.

2.6.1 Data Collection

Secondary data has collected from both published and unpublished sources. Main sources are government published reports, journals, articles, books and reports. The material was collected through the internet search in data bases like google scholar, sciencedirect.com and springers.com.

Information on Small-scale fisheries of India, SSFs Voluntary guidelines, and information about governance Issues in Indian fisheries was explored on the background of theoretical framework to identify properties, challenges of the system to be governed and the governing system.

2.6.2 Data Analysis

Data was analysed by using the document analysis method. As (Bowen 2009), "document analysis involves skimming, reading and interpretation and further doing content analysis by organizing information into categories related to the research questions."

The data was analysed using the Theoretical Framework based on the Interactive Governance theory. The system to be governed and the Governing system was searched on the bases of the characteristics, limitations, and opportunities in the qualitative literature. Analysis from the characterises, limitations and opportunities obtained in the study lead to answer the research questions in this study.

This method is subject to limitations if used solely; document analysis has limitations such as biased selectivity, as documents are created independently of the research agenda. Other limitations of this method are low retrievability of documents and biased selectivity (Bowen 2009).

3 Presentation and description of some of the characteristics and attributes in the system-to-be-governed in SSF in India

This section describes the Indian small-scale fisheries as a system to be governed, focusing on the Governability, understood as the capacity to govern. Indian SSFs properties are described in general and with the analysis of the problems in the system to be governed with the governability lenses in the Diversity, Dynamic, complexity, and scale.

3.1 SSFs in India

Fisheries are an important sector in India in food production that provides food security (Kurian and Sebastian 1976). Fisheries employs 14 million people directly or indirectly in this sector (INDIA 2011). India ranks second in the world fish production with 12.60 million metric tons produced in the year 2017-18, of which 65% is from the inland sector, and about 50% of the total production is from culture fisheries, and create about 6.3% of the global fish production (CMFRI 2017). This is due to the vast coastline, which stretches for 8,118 km and the Exclusive Economic Zone (EEZ) for the country is 2.02 million km, and a continental shelf covering 0.53 million km² (Milne 2010). Fisheries as a resource contribute about 0.91% of the GDP and 5.23% to the Ag - GVA of the country (Financial Express 2020).

India is situated North of the equator between 8 ° 4 'to 37 ° 6' north latitude and 68 ° 7 'to 97 ° 25' east longitude, having 28 states among them 9 are the maritime states where fishing is done (Singh 1971). Besides it, there are 7 Union Territories (UT). Union territories come under the central government of India. Among the seven UTs, four are maritime, of which Daman and Diu and Lakshadweep island falls on the west coast. On the East coast lies Pondicherry and Andaman and Nicobar Islands (Kapur 2004).

On the Northwest Coast of the country lies the Maritime states of Gujrat and Maharashtra that also has the broadest continental; shelf in the country (Strahler and Strahler 2007). On the southwest coast, we find the states of Goa, Karnataka, and Kerala. Here, there is a narrow continental shelf, which is one reason why this is one of the significant upwelling regions in the Indian Ocean (Singh 1971). (SEE FIG 1).

Figure 3. Map of India showing maritime states of India with the EEZ.



Source: - Reprinted from, Brajeet Bhattal's "GOVERNMENT-LED DEVELOPMENT OF INDIA'S MARINE FISHERIES SINCE 1950: CATCH AND EFFORT TRENDS, AND BIOECONOMIC MODELS FOR EXPLORING ALTERNATIVE POLICIES (p 5)."

3.1.1 Defining SSF in India.

This section describes what the Small-scale fisheries are in the Indian context. Considering the diversity of the SSF around the world, the SSFs guidelines have not prescribed a single definition for small-scale fisheries. The guidelines have left it to the implementing agencies to define the small-scale fisheries where the guidelines shall be implemented. There is still a lack of a clear definition. There has been different yardsticks proposed to define SSF in India, such as community involvement in the fishing; size and the material used in the craft; fishing ground depth; distance from the shore; nature of fish landing; channels of market; fishing crew etc. (Jena and George 2018).

The Odisha and West Bengal consultation defined the SSF in the workshop for implementing the FAO guidelines in the East coast of India as per (Salagrama 2015),

"Small-scale fisheries and fish workers are those who, by origin or by occupation, are directly involved in the production of fish and other fisheries resources, fish processing, fish trade and ancillary activities as their major source of livelihood" (p.11).

In the above definition, the word directly involved usage excludes all the managers/ owners and investors from the category of the SSF. This definition even gives places to the crew on the mechanized fishing fleet: the small-scale fishers and the sea food processing industry workers (Salagrama 2015).

The Small-scale fishers can exist in two categories, the first being among the fishers and the other among the shore-based fish workers. From the two categories, only the mechanized boat owners are excluded from the category, so the guidelines' benefits are in favour of only the small-scale fishers.

3.2 Examples of high diversity – the diverse combination in terms of species, craft and gear in SSFs.

There is diversity in species and gear used to catch fish in Indian fisheries. Around 700 different fish species are harvested annually in India, using various gears and crafts combinations (Jena and George 2018). Only after the mechanization of the crafts took place in the fifties, all the Indian fisheries production was done by the small- scale fisheries (Bapat and Kurian 1981).

As explained in the previous section that how is the small-scale fisheries defined in Indian perspective. In this section of the chapter, what craft and gear combination exists in the sector is explained.

According to (Jadhav 2018), the Indian fisheries can be divided into three categories based on the type of technology used in the fishing craft or boat: -

(a) Non – motorized craft

These crafts consist of canoes, plank-built boats etc. The non-motorized crafts use methods such as paddling, polling, or sailing for propulsion and fishing. These can also be very basic, with log planks bound together being some meters long. This sector caught 2 % of the 2013 mainland landed fish (CMFRI 2014). The main gears used for fishing are Hook and lines, Gillnets, Seines (from boats and shores), Bag nets, Traps (CMFRI 2013). These crafts are used with low economic and social power status or where large vessels are banned.

(b) Motorized craft

It is an intermediate gear class that uses an engine only for propulsion. The boats in this category have both inboard and outboard engines for propulsion only. Some boats can be the size of mechanized crafts such as the ring-seiners in Kerala (Gunakar, Jadhav et al. 2017).

However, this category has smaller outboard motorboats. The contribution by this sector was about 23% in 2013 (CMFRI 2014).

(c) Mechanized boats

These vessels have engines permanently fixed to the hull for propulsion. Fishing gears such as trawlers, purse seiners, and longlines are on this vessel's category. These boats are typically up to 20 meters long. This vessel catches around 75 % of the catch in Indian fisheries, making for the 3 million metric tons in the year 2013 (CMFRI 2014).

The craft-gear combination in India's small-scale fisheries can be categorized into mechanized, motorized, and non-mechanized/ non-motorized vessels. These vessels operate with different gears, such as gill nets, seines, trawl nets, hooks, and lines.

These gear combinations have different local names based on the area where they are used. Of all three categories, the mechanized category with an overall length of more than 14 meters can be exempted from the SSF categories. Large-sized Inboard fishing vessels can also be included in it. Rest all the Non-motorized and motorized crafts fall in the category of SSF in the Indian context. Further, for the small-scale fisheries category, the vessels with outboard motorized/ small inboard motorized and all the non-mechanized / non-motorized are included in the category.

Different combinations of gears are used in the SSF to catch some popular species in the country, which can be seen in table 1, showing the gear used to catch species in India's coastal states (Jena & George, 2018).

There has been a community-based effort for resilience in the fisheries in Kerala's southern state, where the fishers have come up with thermocol boats. These boats are non-motorized boats made up of high-density polyethylene having a length of 5 feet and 2 feet wide, gillnets are used for fishing (Jena and George 2018). This community-based effort by the small-scale fishers has empowered them by self-made less capital-intensive fishing boats. According to (India 2017), in Madurai, India, small-scale fishers have been using thermocol boats made up of fish boxes joined with bamboo sticks and nylon strips. Based on the Time of India interview with the fisherman J Thiruthuvam, he reported that they use small nets for fishing, and they can't sail more than 1-3 miles on it. The fishermen on these boats can make a small living.

Table 1. Showing the Popular fish species and the gear used across the fishing states In India.

STATE	FISH SPECIES	FISHING GEAR USED
West Bengal	Bombay duck	MDTN
	Anchovies	MBN
Odisha	Lesser sardines	MDTN
	Indian Mackerels	OBGN
Andhra Pradesh	Lesser sardines	OBGN
	Indian Mackerels	MDTN
Kerala	Indian Mackerels	OBRS
	Oil sardines	MRS
Karnataka	Indian Mackerels	MDTN
Goa	Indian Mackerels	MPS
Maharashtra	Non- penaeid prawns	MDTN
	Penaeid prawns	MDOL
Gujarat	Non- penaeid prawns	MDTN
	Ribbon Fishes	MDOL
Tamil Nadu	Lesser sardines	MTN
	Silver bellies	MDTN

MDTN-Multi Day Trawl Net; MBN-Mechanized Bag Net; OBGN- Out Board Gill Netter; MTN- Mechanized Trawl Net; OBRS- Out Board Ring Seine; MRS- Mechanized Ring Seine; MPS- Mechanized Purse Seine; MDOL-Mechanized Dol. Source:- Small-scale fisheries in India: An Appraisal. (Jena & George 2018, p.19).

3.3 Examples of High complexity, diversity and scale- Market for small-scale fisheries.

The market for SSFs is formed on complicated relationships with the societal structure. It is also higher on the diversity and scale by the multiple actors involved in the fish chain to the international markets for the market, which influence the system's governability.

Fish trade helps increase the country's food security through the employment and income generated by it (Bjorndal, Child et al. 2014). With the fish's domestic trade, the fish becomes accessible to the population and serves as the purpose of food security. In contrast, the International trade bring income to SSFs of India. It is observed that the high-quality fish is exported while the low-quality fish is consumed at the domestic level.

In Indian fisheries, the fish market depends upon the factors such as the fish species, gear used, total volume, and the quality of the fish (Milne 2020). The best quality fish and prawns are exported to foreign countries. The less expensive fish with low quality is sold locally, whereas spoiled fish is used to feed for livestock/ fish feed or in the production of fertilizers. Low-quality fish is also dried and sold in local markets (Jena and George 2018). An adequate supply chain is required for an efficient value chain to emerge that will benefit the SSF of India in the long run.

International trade has a positive effect on the nation's food security; however, it is vice versa (Bjorndal, Child et al. 2014). The international trade in India is facing challenges at the movement, which has also affected the SSFs. The international export trade has gained competition, such as Indian shrimps from low-cost white shrimps from Thailand, Vietnam, and Indonesia (Kumar, Bhatt et al. 2009). There are other factors such as the falling of the Indian rupee against the Us dollar, hike in petrol prices, which affect the industry indirectly. However, the primary issue which impacts on the fish industry for the export market is the quality issue as the post-harvest handling doesn't meet the quality standards for the EU markets for the fish product (Milne 2010).

Secondly, as per (Gunakar, Jadhav et al. 2017), there are other market forces beyond state control. Whether it is the export of prawns to illegal trade to sea cucumber to be auctioned at the global markets. Additionally, in recent years, fishmeal and fish oil production has reduced bycatch, but this has only increased at the large-scale fishers' income. However, the

consequences of unsustainable fisheries are faced by all the fishers. Hence the SSFs suffer in all the ways.

About seventy-five percent of India's fish is domestic consumption, which is of the quantity 2.7mmt (CMFRI 2017). For the SSF, the fish market exists in the fresh local fish and the traditional dried fish and distant urban market. In the local market category, the cheaper fish species with lower quality exist. According to (Milne 2010, p.31), "fish is consumed in the local market and has a major role of the women, the women buy the pelagic fish from the beach landing site, directly or in an auction. After buying the fish, these women sell the fish door to door in the nearby places using bicycles as a mode of transport. This trade provides them with marginal living; sometimes, the fish is bartered for agricultural goods. For the dry fish market, both the pelagic(oil sardines and mackerel) and demersal species(silver bellies, croakers, etc.) are bought by the processors from the landing sites on beaches and later are dried and sold in a local market or to consumers door to door."

There is an active role of middlemen to control the price of fish and multiple stakeholders, which affect the income of the fishers (Parappurathu, George et al. 2017). There is a lack of up-to-date market information for the small-scale fisheries, especially for the fish prices. This leads the fishermen never to know what the reasonable cost of the fish.

SSFs of India face post-harvest losses, making them vulnerable by losing the value on the catch as there is no proper infrastructure for post-harvest processes to support the supply chain. The domestic market supply chain has constraints such as unhygienic and inferior fish handling, inadequate transport systems (lacking cold storage vehicles and roads). The price and the quality of the fish are affected as they cannot reach the landing site to the market due to all the infrastructure problems. In India, the fishing harbours lack amenities such as safe berthing, food, water, fuel, miniature crafts/gears, and fish drying centres (Sampathkumar and Vanjinathan 2015). There are various gaps that the government needs to fill to support the supply chain in fisheries to ensure the fish handling and marketing.

3.4 Example of a dynamic and ungovernable Attribute - Climate change.

All organisms can withstand the change in their environment and can still cope with it, however when the level of growth is beyond their level, the species must go through environmental change (Hijmans and Graham 2006). As per the Intergovernmental Report on

Climate change, it is reported that the average global sea surface temperature of total land and ocean has increased by 0.85 Celsius (Pachauri, Allen et al. 2014). The report also specified that this temperature would tend to rise, causing lower species richness and catch at the tropical latitudes. There would be various biological changes that will support this phenomenon, such as coral mortality and bleaching.

The consequences of climate change are already being felt in India's fisheries and affect small-scale fisheries for a long time. India's small-scale fisheries are primarily dependent on the Indian oil sardine and other small pelagic fish. The deep-sea fish like sardine are dependent on the phytoplankton, which is found all along the coastal waters. The catch of sardine is experiences fluctuations related to the oceanic factors that control the productivity of the coastal waters (Vivekanandan, Rajagopalan et al. 2009). As per (Jena and George 2018, p.26), "In the year 2016, the sardines catch was the lowest in the decade, which directly affects the Small-scale fishers. The higher Sea surface temperature has been observed on India's coastal waters, which is believed to be the cause behind the declining catch of sardines. The fishermen have made it a concern and called it draught of the sea, from which they want the government to support them with relief package as is done in the agricultural industry."

Further, there are the climate change-induced Natural calamities such as cyclones and Tsunami, which have affected the fishermen in the past. The recent Ockhi cyclone in Kerala in the year 2017 was a destructing event for the fishermen as many houses were destroyed, and many had to lose their lives in it. The event caused a loss in the fish landing, about 790 million USD (CMFRI 2017).

3.5 Examples of Complexity

3.5.1 Overcapitalization and overexploitation.

The Indian marine fish catch was looked at as underexploited in the mid-1900s, to which the government focused on motorization of the vessels since the second five-year plan in (1965-86). the fishing technology and investment in large mechanized vessels was increased, which expended more in 1986- 2000, which was the phase III of fisheries development (Bhathal and Pauly 2008). During this period, the motorizing of artisanal feet and fishing offshore fishing took place; new fishing harbours were developed (Milne 2010). The government had good

results from it as the catch from 0.53 million tons in 1950-51 reached 2.9 million tons in 2000-01 (Srinath 2003). Fishing in India was traditionally a caste-based activity, which could not be limited to one specific caste (Bavinck 2001). However, with the modernization of the fisheries, this traditional caste barrier has been broken and attracted more people to join fisheries as a profession leading to overcapitalization in the sector (Milne 2010).

As per (Pauly and Froese 2012), state of world fish resources and Aquaculture, around 25% of fish resources are overexploited, and approximately 50% are fully exploited. In Indian fisheries, the situation is worse; as per (CMFRI 2017), the condition of Indian resources in terms of overexploitation is worse than the rest of the world. The government's wrong approach for fisheries management can be blamed for it; encouraging fishers with subsidies instead of good fisheries practices is the reason behind it. There is a high need to reduce the capacity to support sustainable fishing (Devaraj and Vivekanandan, 1999). India has more than 2.5 times the ideal number of fishing vessels. The overcapacity is reported in all the categories of the vessels except the deep-water vessel. SEE (Table 2).

Table 2 Overcapacity in fishing vessel, showing actual and optimal fishing fleet size.

Fishing vessel category	Actual Numbers	Estimated optimal numbers	Potential overcapacity (%)
Non-motorized craft	106,044	31,058	241
Small-scale motorized craft	76,057	20,928	311

Source: (Milne 2010).

3.5.2 Poor Social conditions of Indian Small- Scale Fishers.

The socio-economic problems associated with Indian fishers are low housing, illiteracy, Poverty and ineptness, and Social Conflicts among fishers (Korakandy 2008). The small-scale fishers in India generally have deplorable housing conditions. According to (Korakandy 2008), "Fishermen houses are crowded, and there is a smell of fish in the allies which attract swam of flies on the food, creating one of the unhygienic places to live."

As per (GOI 2007), the report from the government of India, it has been found that nearly 85% of the houses have excess to electricity, 80% fish villages are connected by roads, 65% have access to hospital within 10 km due to the state government good health structure. Fisher's children suffer from malnutrition and had other diseases associated with poor hygiene (Bapat and Kurian, 1981).

However, nearly 50% of the fishermen are illiterate, and only 6 % have education above the secondary level. As the fishers are illiterate, they can't use the government schemes for them and instead take high-interest loans. According to (Bapat and Kurian 1981), Usually the whole family has a role to play, where the males do the sea fishing, and the landing are taken care of by women, which goes to processing. Fisheries is a labour-intensive job that leads the fishers to retire early, and their children take up the profession at young, losing an education opportunity.

Fisheries in India is a caste-based profession, and the fishers are organized with their caste they fall under, in which most of the fishers belong to the backward caste (Bavinck 2001). As (Johnson 2010), there have been cases of conflict as now higher castes have taken up businesses in the value chain that the SSF think are responsible for their poor conditions. There are also conflicts between fishers and local or regional authorities as the fisheries institutions are being dissolved. Disputes also arise between the traditional or the SSF and the motorized and the mechanized for the insecurity in SSFs; there are instances of burning mechanized boats in Cochin, Kerala (Bavinck 2005). SSFs have complaints of motorized fishers affecting them by destroying their gear by their ships or destroying of eggs and larvae of fish by fishing on them (Jena & George, 2018).

SSFs are always in dept and have low incomes to support their family. The traditional boat owners' annual average income is Rs 25000 to RS 100,000 (Milne 2010). Most of the fishermen still borrow money from the middlemen for the fishing operation, and they sell the catch back to the middlemen at the rates fixed by the middlemen to pay the loan back to them., making the condition of the small -scale fisher very pitiable(Bapat and Kurian 1981). The middlemen can also manipulate the loan interest, which leads the fishermen to surrender the boats and gear to him and work under the middlemen. The middlemen would often finance the fishermen with boats and equipment to keep them making the profit for him, which lead fishers with no motivation to increase the industry stuck in perpetual low profits and debt.

Hence, the system-to-be-governed system has various challenges, which makes it difficult to be governed. Backwardness in terms of Education and the caste system sets back fishers to take advantage of government schemes and loans. Besides its climate change and natural calamities that worsen their condition. Lack of infrastructure to support post-harvest activities and the wrong government policies which leads to overcapitalization and overexploitation creates tragedy of commons in Indian fisheries. All these factors contribute to forming in making the system-to-be-governed as a difficult to govern.

4 Presentation and description of some characteristics and attributes of the Governing system for SSF in India.

4.1 Modes of Governance-Governing structure of Indian Fisheries.

India being the federal state, the power for the fisheries policy creation is divided between the state and the central government. The territorial waters up to (12 nautical miles) are subject to jurisdiction by the state government. In contrast, the central government has the jurisdiction of water beyond the territorial waters and up to EEZ (Sathiadhas and Shyam 2012).

Under article 246 of India's constitution, the state makes laws and regulations in relation to fishing, fish marketing, and fish welfare schemes. In contrast, the central government under the union list is responsible for surveying and assessing resources, doing the research and training in India's fisheries, and giving financial assistance to the states. It is also the role of the central government (Somvanshi 2001).

There is no separate Fisheries Ministry in the country, fisheries as a sector is administrated by the Ministry of Agriculture under the Department of Animal husbandry and Dairying and Fisheries. (DAHD&F).

4.1.1 Examples of Hierarchal governance Central/federal-government policies.

The fisheries policies have been guided by two legal documents in India, the planning commission and the Central Marine Fishing policy 2004 (CMRF 2004). Other policies such as the Deep-sea policy and the Trade policy developed over time with need.

According to (Bhathal 2014), "The Indian economy went defaulted of the loan from International Monetary fund (IMF) in the year 1991, which led to the liberalization in various activities such as on the reduction of import duties as well as consequences were observed as reduced reliance on the subsidies and government participation. Further in the same year 1991, it was realized the fishery resources were being overexploited at its full extent in the coastal waters, while the inland fisheries and the deep-sea fisheries were underdeveloped, so a Deep-sea Fishing policy was formed" (p.11).

4.1.2 Five-year plans.

The fisheries received policy by the planning commission's five-year plans until the Comprehensive policy was adopted for fisheries in 2004. The five-year plans consisted of the objectives to be achieved for the fisheries sector in India. There has been observed a change in the goals and strategies on which the fund would be spent. Over the years, starting with the first five-year plan, the focus was on providing the fish to the poor for protein supply, which was later shifted to an increase in foreign exchange as in the 9th five-year plan. In contrast, recently, the focus has shifted to conservation and management, as noted since the 10th five-year plan, from 2002 to 2007 (Commission 1953, Commission 1997, Commission 2002). (see table 1.1).

According to, (Bhathal 2014), the primary goals in these five-year plans for policy development has been as:-

1. To increase the fish supply.
2. Increase the economic growth and Employment.
3. In the first few years of the five-year plans, fleet modernization explores the
4. deep-sea fisheries.
5. To improve the socio-economic condition of the fishing.
6. Boost the export of marine products.
7. Improve research and training for the fishing.
8. Improvement in the fisheries infrastructure and post-harvest.
9. Implement an integrated approach for fisheries and aquaculture.
10. Make fisheries sustainable along with maintaining ecological integrity.

At present, the Planning commission of India is called (NITI Aayog in Hindi.) it is a policy think tank of the government made to achieve sustainable development goals and broader sustainable matters. However, the approach now is bottom-up, which was missing in the five-year plans by which the government and the state government decide on the policy formation.

4.1.3 CMFP (Comprehensive Marine Fishing Policy 2004.)

It is the current national fisheries policy in India. There are three key objectives of this policy (Commission 2005): -

- To reach a sustainable level of fish production and to boost the export of seafood,
- Increase the per capita protein for the nation's population.
- To ensure the socio-economic security for the artisanal fishermen (SSFs) who are
- Solely depended on fisheries for their livelihood.
- Ensuring the sustainable development in the fisheries sector with concern for
- Ecological integrity and biodiversity.

In addition to the above objectives, the CMRP has other ten components: stringent fisheries management system with an improved regulatory and monitoring, surveillance system (MCS) systems. To keep sustainability in all policies, the code of conduct for Responsible fishing (CCRF) is incorporated (Commission 2005).

Further, this policy has successfully improved the small-scale fishers in India by the government led initiatives such as by motorization of up to 50% traditional boats and the infrastructure to support the industrial sector (Bhathal 2014). The government has initiatives to bring the SSFs traditional and coastal fishers in harmony with other stakeholders functioning in the deep-sea industry.

4.1.4 Deep sea policy and Trade policy.

The deep-sea policy was initiated after the EEZ was declared in 1976, which led to the formation of this policy in 1991 after various revisions. The deep-sea policy had the goals to include foreign vessels in the deep-sea fishing as in those years country was not significantly developed in deep sea fishing with trawlers and Tuna fishing especially. As per (Das 1993), there were three schemes in this policy, i.e. (1) leasing the foreign vessels to operate in India's EEZ water beyond 12 nautical miles. (2) Joint ventures between Indian and Foreign vessel of 49: 51 in the deep - sea fishing areas. (3) Engaging foreign vessels for test fishing.

This policy has received resistance from the small-scale fishers as the fishermen claim of the foreign vessel fishing in their territory, leading to conflicts between the two sectors (Mathew 2003).

After the Indian economic crisis and the IMF's defaulted loan, Indian fisheries had to be liberalized. As per (Bhattal 2014), various changes were made in the trade policies, such as the value or nature of export or import in fisheries and agriculture was made less restricted. Secondly, the measures other than tariff and duties were taken entirely off in the year 2001. Lastly, the fish products could be exported under the standard license.

4.1.5 State's government policies: -

The state fisheries policies are developed based on the two key documents the five-year plan and the Comprehensive Marine fisheries policy 2004. Each maritime state in India has its own fisheries policies. The states focus on to improve the socio- economic conditions of the fishers and increase the fish catches, however lacking in a sustainable fisheries management approach.

After the independence of India in the year 1947 the states enforced various Marine fisheries regulations acts which are listed in the table (1) (Bhattal 2014).

1. The Fisheries in the territorial waters of the states are managed by the Marine fishing Regulation Acts which follows
2. Based on the vessel the fishing zone is demarcated.
3. The vessels must be registered and should have a valid license.
4. Registration of the specific gears, mesh size and closed season.

Table 3: Marine Fishing Regulation Acts of the states and the Union territories in India.

States and UTs	Marine Fishing Regulation Act	Area reserved for traditional vessels	Area available to mechanized vessels	Fishing seasonal closures	Gear regulations (mesh size restrictions- must not be less than)
Gujarat	Gujarat Fisheries Act – 2003	Up to 5 nm (9.3 km)	Beyond 9 km	10 June - 15 August (67 days)	40 mm cod end of trawl net
Maharashtra	MFRA 1981	Up to 5 - 10 fathoms depth	Beyond 10 fathoms depth	10 June - 15 August (67 days)	35 mm cod end of trawl net
Goa	MFRA 1980	Up to 5 km	Beyond 5 km	10 June - 15 August (67 days)	24 mm any net for catching fish; 20 mm for catching prawns.
Karnataka	MFRA 1986	Up to 6 km	Less than 15m OAL: 6 - 20 km; Greater than 15m OAL: beyond 20 km.	15 June - 10 August (57 days)	30 mm cod end of trawl net
Kerala	MFRA 1980	12 - 25 fathoms depth	Less than 25 GRT: 20 - 35 fathoms depth	15 June - 19 July (45 days)	35 mm cod end of trawl net; 20 mm ring seines and dip net.
Tamil Nadu	MFRA 1983	Up to 3.4 nm (6.3 km)	Beyond 3.4 nm (6.3 km)	East coast 15 April - 29 May (45 days); West coast 15 June - 29 July (45 days).	25 mm for gillnet; 37 mm cod end of fish trawl net; 40 mm cod end of prawn trawl net.
Andhra Pradesh	MFRA 1994	Up to 8 km	Less than 15m OAL: 23 km; Greater than 15m OAL or 25 GRT: beyond 23 km.	15 April - 31 May (45 days)	12.5 mm cod end of trawl net
Orissa	MFRA 1981	Up to 5 km	Less than 15m OAL: 5-10 km; Greater than 15m OAL: beyond 20 km	15 April - 15 June (60 days)	
West Bengal	MFRA 1993	Vessels less than 9 m - up to 8 km	Vessels greater than 9 m - up to 20 km but beyond 8 km; Vessels above 15 m - beyond 50 km	15 April - 31 May (45 days)	
Daman and Diu	MFRA 1980	Up to 5 km	Beyond 5 km	10 June - 15 August	24 mm any net for catching fish;
Lakshadweep Islands	MFRA 2000				20 mm for seines and trawl net; 50 mm for gill net.
Puducherry	MFRA 2008	3 miles (4.8 km)	Beyond 3 miles (4.8 km)		
Andaman and Nicobar Islands	MFRA 2003	Up to 6 nm (11.1 km)	Up to 6 nm (11.1 km) for vessels less than 30 hp; Beyond 6 nm (11.1 km) for vessels greater than 30 hp.		25 mm for gill net, shore seine and drag net; standard mesh size, i.e., 35 mm for trawl net.

Source: -, Brajeet Bhattal's work, Marine Fishing Regulation Acts of the states and the Union territories in India. Reprinted from "GOVERNMENT-LED DEVELOPMENT OF INDIA'S MARINE FISHERIES SINCE 1950: CATCH AND EFFORT TRENDS, AND BIOECONOMIC MODELS FOR EXPLORING ALTERNATIVE POLICIES (p 25)."

4.1.6 Examples of self-or co-governance Local Level Governance system (Panchayats)

According to (Sathyapalan and George 2015), "By the 73rd and the 74th amendment of the constitution in 1992, the state government is under the law must decentralize the power to the local self-governing institutional bodies such as panchayats. And the 11th and 12th schedule of the constitution has listed the subjects which fall under the self-government. The members of this local government are elected every five years, and one-third of the seats are reserved for the women and the socially and economically backward classes" (p.92)

Panchayats are a local self-governing body that plays a crucial role in protecting the small-scale fishermen's rights. Despite the rights that panchayats have on paper no official mandate in resource management and conflict resolution, these rights are exercised with the state fisheries department only (Sathyapalan and George 2015). Further, there is a coordination gap between different structures of governance in Indian fisheries

India's fishers fall under the Dheevara caste, which is considered in other backward classes in India (Anantha Krishna Iyer 1909). Fishers gain the government's social and economic benefits by belonging to the other backward classes (OBC). Being an OBC in India gives the benefits of reservation of 27% in public sector employment and higher Education (Parasuraman, Srinivasan et al. 2011). The SSFs of India strengthen themselves to make their voices heard through the institutions based on the caste system they are based on. Usually, the backward castes influence the political parties and further form these institutions, such as the Dheevara Maha Sabha, a political institution based in Cochin, Kerala, which is formed based on the Dheevara caste (Sathyapalan and George 2015).

India's small-scale fishers are considered socially backward, landless, and without any political influence compared to various other stakeholders involved in fishing activity, which puts them in a competitive position for the resource. The fishers to full-fill their livelihood adapt to non-compliance of fisheries management rules. Looking at this problem from the Governability perspective, the SSFs are part of the system to be governed and are in a socio-economic system, which raises the issue of diversity in the composition of stakeholder groups concerning the demographic profile, Interests, Property rights as well the political orientation (Bavinck and Kooiman 2013)

As per (Jentoft, Chuenpagdee et al. 2017), if the system to be governed is highly diverse with the mixed fisheries and various stakeholders, it requires maximum decentralization and self-governance.

Their exits lack coordination between the local self-government, customary organization, and the fisheries department in Indian fisheries (Sathyapalan and George 2015). There is a need to strengthen institutions such as Panchayats that support India's small-scale fishers directly. The Indian fisheries require the decentralization of power to the local government level, which requires institutional and organizational change.

4.2 Attributes of Governing system.

4.2.1 Diversity in Governing system

Governing of Indian fisheries is done at three levels the central government, the state government, and local institution panchayats. The Governing mode is Top-down in Indian fisheries. The governance system is diverse, with mixed modes of Governance, primarily the Hierarchical mode and self-governance at some scales. India being the federal state, the power for the fisheries policy creation is divided between the state and the central government. The territorial waters up to (12 nautical miles) are subject to jurisdiction by the state government.

In contrast, the central government has the jurisdiction of water beyond the territorial waters and up to EEZ (Somvanshi 2001). Under article 246 of India's constitution, the state makes laws and regulations in relation to fishing, fish marketing, and fish welfare schemes. In contrast, the central government under the union list is responsible for surveying and assessing resources, doing the research and training in India's fisheries, and giving financial assistance to the states. It is also the role of the central government (Sathiadhas and Shyam, 2012).

According to (Ghosh and Kumar 2003), "By the 73rd and the 74th amendment of the constitution in 1992, the state government is under the law must decentralize the power to the local self-governing institutional bodies such as panchayats. And the 11th and 12th schedule of the constitution has listed the subjects which fall under the self-government. The local government members are elected every five years, and one-third of the seats are reserved for the women and the socially and economically backward classes."

The panchayats act as the co-existing institution in the Indian fisheries. It has to be noted that instead of panchayats having a place in the legislation, however, officially, panchayats lack the power to interfere with the resource management or with resource related conflict resolution at the state or district level (Sathyapalan and George 2015). Although panchayats play an active role in fisheries governance, this gives rise to legal pluralism in Indian fisheries lowering the overall governability. Also, as per (Sathyapalan and George 2015), the panchayats are excluded from implementing the fisheries programs, and even though fishers are part of panchayats, they consider it a shortcoming. However, they can implement fishers' plans in a more equitable and without any conflicts from fishers.

Besides Panchayats, other such customary institutions in Indian fisheries, such as formed by the caste system and the bases of the religion created by the church, protect the fishers by providing them social security (Bavinck 2005). However, these institutions co-exist with the state and other local institutions, giving rise to legal pluralism.

4.2.2 Complexity in Institutional nestedness and scale.

Hierarchical governance mode, which is prominent in the Indian fisheries and more specifically is a type of constitutive hierarchy; in which the lower levels of Institutions are included in the higher level, and these levels have functional relationship affecting each other (Gibson, Ostrom et al. 2000). The Indian fisheries' lower level of Institutions function on caste, religion, etc., affecting code of conduct. Geographical Scale and nestedness of the institutions affect governance as this impact the outlook of the policies and goals.

There arise various challenges in Multi-level of governance in Indian fisheries. As per (Salagrama 2015); the author has identified two types of gaps caused by the Hierarchical mode of governance in India: -

1.Coordination issues within the policy objectives of the same ministry / department.

The central government has Primarily four objectives for fishing: increasing production, livelihood support, social welfare, and conservation/ management. However, as it is observed that the four goals are not coordinated with each other. For instance, a Fishing ban is imposed on Indian fishing as a conservation measure. Still, its implication is not considered with different goals, as 60% of the income is reported by the Motorized category in April and May when the fishing ban is imposed. Another such failure incoherence is observed with the

government providing subsidy in fuel to the trawlers to increase the production, but the post-harvest Infrastructure devolvement is left unattended. As the Indian fisheries are overcrowded with too many fisheries fishing, there seems no point in giving subsidies rather than creating alternate employment.

2. Coherence issue in policies at the Horizontal level.

Different ministries such as Fisheries, Environment and forests, Education etc., make policies with no coordination between them, which hinders the implementation. It is observed that the state ministry gives licenses to the fishers without the inclusion of the fisheries ministry. Ministry of fisheries and the social development ministries show no coordination in delivering the social benefits as the fishers can also benefit from the central government. Still, with no coordination, the relief funds remain unutilized. There are various social welfare schemes such as MGNREGS, which stands for Mahatma Gandhi National Rural Employment Guarantee Scheme, which offers alternative jobs and relief during the fishing Ban but with no coordination remains unutilized.

The above-observed coordination gaps are with the institutional nested with larger-scale which cause unclear rules, weak enforcement and management as can be accepted in a higher complexity governance structure such as in Indian fisheries hampering the governability.

The above-observed coordination gaps are with the institutional nested with larger-scale which cause unclear rules, weak enforcement and management as can be accepted in a higher complexity governance structure such as in Indian fisheries hampering the governability.

4.2.3 Institutional dynamics and scale Issues.

Institutional changes can be slow or rapid, both of which lower the overall governability. Fishers function inside the institution with the norms and rules which influence their behaviour. Institutions dynamics is influenced within or outside the fisheries. Institutions are required to change at a progressive pace, so for the governing system to function well. Institutional dynamic is also the institutions ability to adapt to the changes (Bavinck and Kooiman 2013).

An example is the Tenure rights problem, which has been in Indian fisheries and is one of the crucial issues discussed in the SSF voluntary guidelines. Tenure rights for the SSFs have been

lost by changes in the policies driven by external factors in the fisheries policies. As the legislation and the market changed post-independence, the fisheries policy then shifted to modernization of the fisheries, which affected the customary rights (Salagrama 2015). The customary institutions based on caste, religion in the fisheries were left unrecognized. They had to loosen their common property rights to states' laws and the panchayats that gained control over these CPR and its revenue. Later in the year 1990, the liberalization of the policies leading to coastal development further shut the fishing rights for SSFs.

Even though the SSFs lost their customary rights in this process, they still survived as they changed in an institutional setup to the needs. The small-scale fishers have been performing well, showing sustainable fisheries management in an institutional arrangement. The Padu system found in Kerala's state is a Caste, gear, and species-specific institution that has been performing very well. This customary system functions through the lottery to allocate sites to a group of fishers to fish on a site rotationally (Lobe and Berkes 2004).

It is also observed that when there is a change or shift on policies against the SSFs, such as favouring the fleet's mechanization or taking over the Common property rights of the fishers, the sustainability is observed more in the customary institutions such as the Padu system of Kerala. The fishers, when outside the institution, shall adopt Non-compliance to rules such as the use of all illegal fishing practices (Bavinck and Kooiman 2013).

The problem with the Tenure rights is to know who the real users of the tenure are. As the fisher's functions inside the institutions, so it is vital to value the customary systems. It is high time that states should strengthen the customary systems' existence as they have a rich knowledge of the resource base.

4.3 Gaps Identified in the Governing system

The Indian Governance structure is diverse in structure functions in a hierarchal mode of governance that is subject to its own limitations with coordination and coherence in the departments and policy—the governing system functions in a top-down governance approach. The state government is independent to make laws, but it is observed that except from giving license and rudimentary regulatory, the management and roles with states are not well defined (Milne 2010). The governing system weakens in India with the presence of Legal pluralism formed by Customary institutions based on Caste and religion, as legal pluralism lowers the quality of governance by affecting incoherence in the law (Bavinck 2018).

In addition to it (Milne 2010, p.56), Highlights some of the shortcomings in the Legal Framework of the Indian fisheries is outdated and has various gaps. Firstly, the Comprehensive Marine Fishing policy 2004 fails to deliver three main goals: economic, social, or sustainability. The policy focuses on demarcating the fishing areas rather than Clearly defined fishing rights for sustainable fisheries. Another void is observed that there just a few legal instruments that are governing the marine fisheries. The Indian Legal framework is not focused on strengthening domestic fisheries management. In addition to it, the authority directly involved with the SSFs lacks the capacity to implement the goals. Panchayats, which are an essential institution, lack legislation power with resource management. There is also an evident lack of policy coherence in the governing structure due to the hierarchical governance causing power imbalance and causing policy mismatch.

5 The FAO voluntary guidelines.

As per the United Nation's Food and Agriculture Organization (FAO), around 90 percent of the people involved in the fisheries are from small-scale fisheries, which constitutes about the world's 51 million fishers (Jentoft, Chuenpagdee et al. 2017). In addition to it, hundreds of millions of people involved in the value chain in fisheries are from SSFs. These fisheries have an essential role in food for local, national, and international markets and services in generating income for supporting the local and global economies.

Despite the large number of people involved in this sector and the immense contribution they make to the economy, food security and nutrition, and employing the large population, especially in the developing countries, the government often overlooks this sector in the decision making at various levels (Chuenpagdee and Jentoft 2015). Moreover, these fisheries suffer from poverty in terms of income and fundamental human rights, including civil, political, economic, social, and cultural rights. Besides, to majority of the small-scale fishers have poor access to health, education. The majority of the population is severely affected by HIV/ AIDS (FAO 2020).

The SSF population is trapped in various social problems that hinder the guarantee of human rights, such as lack of alternative livelihoods, forced labour, child labour, lack of gender equality. SSFs are affected by natural or human-made disasters, affecting the fisheries' sustainability, such as climate change, pollution, and environmental degradation. It must be noted that all these adverse outcomes are related due to the socio-ecological structure of this sector.

According to (Jentoft, Chuenpagdee et al. 2017), "The committee of Fisheries (COFI) endorsed the voluntary guidelines for securing sustainable small-scale fisheries in the context of Food Security and Poverty Eradication at the thirty-first session in June 2014. These guidelines are the result of several sessions which took place between the year 2011 to 2014 by the FAO committee of fisheries (COFI), which included more than 4000 participants from 120 countries in the bottom-up participator manner, including the small-scale fishers and their organizations, researchers, representatives of the governments and all the other relevant stakeholder."

Finally, the guidelines were endorsed, which was a historic movement for all the Small-scale fishers worldwide. It was the first international recognition achieved to secure sustainable small-scale fisheries that could eradicate hunger and poverty. COFI works closely with FAO and has two main functions: to check the work on FAO's program and their implementation in fisheries. COFI also conducts periodic checks on the global fisheries problems and later evaluates these problems and proposes potential solutions to them by the FAO.

The guidelines are in the form of a document that guides the state and the stakeholders in forming the policies, legal framework that would lead to responsible and sustainable small-scale fisheries. The guidelines aim to enhance the contribution of SSF to global food security and nutrition while also improving the socio-economic condition through sustainable fisheries management practices. In addition to it, the guidelines complement the code of conduct of Responsible fisheries. (CCRF), right to adequate food (the Right to Food Guidelines), Responsible Investment in Agriculture and Food Systems (the RAI Principles), Responsible Governance of Tenure of Land, Fisheries and Forests (the Voluntary Guidelines on Tenure), UN Declaration on the Rights of Peasants and Other People Working in Rural Areas and the UN Sustainable Development Goals (the SDGs) in particular Goal 14.

The voluntary guidelines for securing small scale fisheries are focused on the Human Right Based Approach, which not only provides the SSF with the fundamental human right but also makes them to participate in decision making such as the fishers should be aware of the rights they have, which gives them access to food, proper standards of living and decent working conditions (Willmann, Franz, et al. 2017).

There are different chapters in the guidelines which serve as a guide for the states about how they should take up the procedures. The document of the guidelines is divided into three parts where the Part 1 is the introduction, which describes the objective, nature, and scope of the guidelines, Part 2 of the document with the title Responsible fisheries and sustainable development has five chapters which talk about the Measures the state should take to improve the SSF in emphasizing the human rights and dignity, respect for cultures, non-discrimination, social justice, gender equality and equity (Jentoft, Chuenpagdee et al. 2017). These goals lead to good governance for the SSFs in Poverty Eradication and food security while maintaining sustainability.

In the part 3 of the guidelines talk about the policy development in coherence with regards to the international human rights law, national legislation and other instrument related to indigenous people to promote a holistic development for small-scale fishers Maintaining a long-term plan in the fisheries policy which will help to eradicate poverty and hunger. The guidelines talk about the cross-sectoral collaboration of the Institutions, which are local-national- regional and global, to achieve these goals. Further, the states are suggested to strengthen the local institutions for implementing and promote research on SSF with strengthening the capacity (FAO 2020, p.15).

Lastly, the guidelines refer to the implementation of the guidelines, which is also a research question. Since the nature of the guidelines is voluntary, however, the states are accountable morally for what they have done to implement them(Jentoft, Chuenpagdee et al. 2017).Moreover the guidelines ask to create awareness through the involvement of CSOs and report it back to FAO on the progress made (FAO 2020, p.18).

As per (Chuenpagdee and Jentoft 2015), "The implementation of the guidelines require a major policy initiative and governance reforms. As the Guidelines favour the human rights and equity-based principles which challenge and interfere with the power relations which will hinder the implementation process. The guidelines call for reforms which involve the redistribution of resources among various stakeholders and other governance challenges".

Therefore, it is essential to study the limitations and opportunities for implementing the guidelines concerning the governing system and the system to be governed. The results of which will highlight the solutions for Implementation. In the next section of the thesis, all the barriers will be discussed which are hindering the implementation of the guidelines and based on it what governance reforms would be required for the performance of the procedures will be addressed.

6 Discussion

6.1 Obstacles observed in the Governing system.

This study's first objective was to identify the obstacles caused by the characteristics of the system-to-be governed and the governing system and by the interactions between both systems. This study aimed not only to identify the characteristics of how they exist in both the systems and their interactions but also to find the obstacles to governability by these interactions that further how the interactions hinder the implementation of the FAO guidelines for securing SSFs. (Jentoft and Chuenpagdee 2015), make the very valid point that the governability assessment serves as a holistic analysis to understand what SSFs are, their contribution, and where their governability challenge exists. This study showed the SSFs in the Indian context are rooted in highly diverse, complex, and dynamic structures both within the system-to-be governed and with the interaction with the governing system.

SSFs are highly diverse, complex, and dynamic in characteristics, which is also evident in the Indian context. The governability is influenced when the natural system and the social system interact within the system to be governed, creating complex structures for the governing system (Kooiman and Bavinck 2013). The study reveals various such complex relations in terms of diversity, complexity, dynamic, and scale., such as in terms of species- gear and craft used to fish, middleman role in the fish chain, climate change, influence of foreign market, In addition to it, Backwardness in terms of Education and the caste system set back fishers to take advantage of government schemes and loans. The lack of infrastructure to support post-harvest activities and the wrong government policies that lead to overcapitalization and overexploitation contribute to forming in making the system-to-be-governed a challenging to govern.

Asides from the characteristics of the system-to-be-governed, the governing system, when interacts with the system- to- be- governed too imposes challenges to the governability. The governing system in India functions in a hierarchal mode generating obstacles for the governing system and the interaction with the system-to-be-governed. As the review of the governing system characteristics presents that informal governance structures are functioning in the Indian governing system. Although these informal institutions aim to govern sidewise with the legal system, it nevertheless creates diversity and gives rise to Legal Pluralism. To

this (Bavinck and Kooiman 2013), make the very valid point that how much the governability gets affected by legal pluralism depends on the degree of pluralism in the system. As (Sathyapalan and George 2015) and (Salagrama 2015) state, the customary systems are weekend by the formal Indian governance structure. When these non-formal customary institutions operate, that causes non-compliance and the fishers violate the rules that work against the recognized customary systems. In addition to it, customary institutions fill the void of governability, such as the Padu system in Kerala, a gear-caste-specific formalized customary institution (Lobe and Berkes 2004). However, there are problems with these customary institutions of subtraction, which is an issue of further research. Hence it becomes essential to identify the customary institutions and adapt the governing system to them; otherwise, governance can cause misfiring, damaging the small-scale fisheries (Jentoft 2004).

The governance mode found in the Indian governing system is primarily a hierarchical mode that is subject to complex, multi-level, and fragmented governing structures that hinder coordination and integration among various Indian fisheries governance (Chuenpagdee and Jentoft 2018). Further, the hierarchal mode functions in a chain of commands from top-down and bottom-up that creates fragmented institutions that are not included in the higher level in the hierarchy. A complex system to interactions may emerge and hence lower governability (Gibson, Ostrom et al. 2000). Moreover, the scale of operation contributes to lowering governability as implementation of the policies is affected by the state being far distant from the Small-scale fisheries (Jentoft and Chuenpagdee 2015).

Hence the study has identified governability challenges caused by the interaction within and between the system-to-be governed and the governing system based on the characteristics such as diversity, complexity, dynamic, and scale. Therefore, obstacles arise due to the both the characteristics of the systems and the mode of governance, which is hierarchal mode primarily. The study shows the need to reform the hierarchal mode to facilitate improved SSF governance as the FAO guidelines call for, rather than to shift to another mode of governance. A reformed mode of governance can work for the guidelines to fit well.

6.2 Reforms required in the Governing system

Another objective of the study was to look for reforms based on the obstacles to implement the guidelines. Based on the characteristics which were observed in the governing system interaction through the diversity, complexity, and dynamic, it is observed that the hierarchal mode of governance is prominent in Indian fisheries. As most of the issues identified was related to the hierarchal mode of governance, there is primarily the coordination and coherence issue in the departments and policy. This finding seems consistent with the argument from Jentoft and Chuenpagdee (2015) of building capacity in the hierarchal mode instead of changing governance mode

Further, in part 3 of the FAO guidelines three primary requirements are listed as necessary for the guidelines to be implemented in a particular country: -

- Policy coherence, Institutional coordination, and collaboration.
- Information, Research, and communication.
- Capacity Development.

In relation to the first case requirement in India, it is required to improve the horizontal mode coordination at various levels, such as ministries and departments, to facilitate policy coherence. For improved institutional coordination, it is advised to strengthen the vertical integration in the horizontal mode by including all the vital actors, especially the panchayats. Fish worker organizations- cooperatives should step up to improve conditions for the SSFs. As the policy -institutional coherence is noticed best at the lowest level in the Hierarchal mode; therefore, it becomes essential to decentralize at the local panchayats level for better coherence (Sathyapalan and George 2015).

With respect to the existing policies, the FAO guidelines implementation should be promoted at the local level through the agencies such as panchayats, Civil society organizations, Fish workers organization, and Self-help groups (Salagrama 2015). In contrast, the policies that are still underway with the FAO guidelines should be dealt with at the state and district levels.

The FAO guidelines also emphasise other requirements necessary for the SSF under Information, Research and Communication and Capacity building. As the SSFs are a new area of research and there are still many gaps that need to be filled, the guidelines recommend performing research on the information about the guidelines. In an Indian prospect, there are various voids observed, firstly there lacks a clear definition of the SSFs. Apart from this, also

data is required on various aspects of the SSFs. The state needs to research on the needs of SSFs specially to try to include indigenous knowledge in research.

Lastly, the capacity building should be strengthened in order to implement the guidelines in India. According to (Salagrama 2015, p.59), “Fish worker organizations should take forward the agenda of the SSFs for the implementation which is noticed to be weak in Indian context. Strategies should be made to get support from all relevant bodies for the implementation. The capacity building for the implementation should focus not only on SSF but also on other relevant institutional actors, research organizations, and CSOs. Capacity-building should focus not only on the women, as the guidelines have stated but also on training men as they are equally vulnerable as women. Moreover, capacity building programs should be initiated on the needs of the vulnerable and marginalized groups which could contribute to enhance the capacity and to have a follow up on these programs.”

6.3 Limitations & Recommendations

Every research has some limitations as the investigation progresses step by step. The major challenge in the study was with the scale and disparity which exists in India, as the policies and the problems of the fisheries can vary from place to place. One approach that works in one area may not work in another place. However, this study uses examples based on literature and tries to give a brief view of potential challenges and solutions. The analysis method used in the study has limitations although it is efficient in finding the problems and solutions using the governability assessment, but as (Song, Johnsen et al. 2018), points out; the system complexity makes it almost impossible to describe all properties in the governing system and the system-to-be-governed. This approach could better work for small-scale analysis supported by data on human dimensions. As the guidelines are very new, and there lacks research literature about the guidelines in the Indian context.

7 Conclusion

This study aimed to find the obstacles associated with the characteristics of the system-to-be-governed and the governing system and to, investigate the reforms required to implement the FAO guidelines for SSFs in India.

The characteristics of both the system showed that to improve governability is a challenge that require reforms. This Because, the SSFs are diverse, complex, and dynamic, which was also proved in the study. Further, when the system-to-be-governed interacts with the governing system, which is also diverse, dynamic, and complex, characteristics, Legal pluralism, Coordination and coherence become evident challenges for a system in a hierarchal mode of governance.

As these governing obstacles lower the governability in the Indian governing system, they ultimately lower the possibility of achieving the FAO guideline's goals for securing small-scale fisheries. This study tries to improve governance by recognizing the problems and suggesting reforming the governing system by decentralization, strengthening and recognizing the institutions such as panchayats, customary institutions, reforming the coordination and solve coherence issues in the hierarchal mode, and lastly points to capacity building and strengthening research and information for the SSFs. The reforms suggested in the study, may contribute to achieve the FAO guideline's goals by ultimately improving the governing system to secure small-scale fisheries in the Indian context.

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