

MARE Publication Series 19

Silvia Salas
María José Barragán-Paladines
Ratana Chuenpagdee *Editors*

Viability and Sustainability of Small-Scale Fisheries in Latin America and The Caribbean

MARE Publication Series

Volume 19

Series editors

Maarten Bavinck, University of Amsterdam, The Netherlands

J.M.Bavinck@uva.nl

Svein Jentoft, UiT-The Arctic University of Norway, Norway

Svein.Jentoft@uit.no

The MARE Publication Series is an initiative of the Centre for Maritime Research (MARE). MARE is an interdisciplinary social-science network devoted to studying the use and management of marine resources. It is based jointly at the University of Amsterdam and Wageningen University (www.marecentre.nl).

The MARE Publication Series addresses topics of contemporary relevance in the wide field of 'people and the sea'. It has a global scope and includes contributions from a wide range of social science disciplines as well as from applied sciences. Topics range from fisheries, to integrated management, coastal tourism, and environmental conservation. The series was previously hosted by Amsterdam University Press and joined Springer in 2011.

The MARE Publication Series is complemented by the Journal of Maritime Studies (MAST) and the biennial People and the Sea Conferences in Amsterdam.

More information about this series at <http://www.springer.com/series/10413>

Silvia Salas • María José Barragán-Paladines
Ratana Chuenpagdee
Editors

Viability and Sustainability of Small-Scale Fisheries in Latin America and The Caribbean

 Springer

Editors

Silvia Salas
Marine Resources Department
Cinvestav Mérida
Mérida, Yucatán, Mexico

Ratana Chuenpagdee
Department of Geography
Memorial University of Newfoundland
St. John's, NL, Canada

María José Barragán-Paladines
Development and Knowledge Sociology-
Social Science Department
Leibniz Centre for Tropical Marine
Research (ZMT)
Bremen, Germany



Too Big To Ignore (TBTI; toobigtoignore.net) is a global research network and knowledge mobilization partnership, funded by the Social Sciences and Humanities Research Council of Canada, and supported by 15 partner organizations and over 400 members from around the world. The network aims at elevating the profile of small-scale fisheries, arguing against their marginalization in national and international policies, and developing research and governance capacity to address global fisheries challenges.

ISSN 2212-6260

ISSN 2212-6279 (electronic)

MARE Publication Series

ISBN 978-3-319-76077-3

ISBN 978-3-319-76078-0 (eBook)

<https://doi.org/10.1007/978-3-319-76078-0>

Library of Congress Control Number: 2018939180

© Springer International Publishing AG, part of Springer Nature 2019

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Cover illustration: Hard-working circle net fishermen, Trindade, Brazil, December 2010, Courtesy of Patrick McConney, The University of West Indies

Printed on acid-free paper

This Springer imprint is published by the registered company Springer International Publishing AG part of Springer Nature.

The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Foreword

In June 2014, a remarkable world event took place during the 31st Session of the Committee on Fisheries (COFI) at the FAO Headquarters. FAO member states formally endorsed the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines). The SSF Guidelines are now in place and initiatives are being pursued to begin their implementation.

When my esteemed colleague Dr. Silvia Salas kindly invited me to read the book that she was coauthoring and coediting with Dr. M. Jose Barragán-Paladines and Dr. Ratana Chuenpagdee – within the frame of the activities in support of the SSF Guidelines being carried out by Too Big to Ignore: Global Partnership for Small-Scale Fisheries Research (TBTI) – I could not help but experience some flashbacks related to my past work connected with small-scale fisheries in the Latin America and Caribbean (LAC) region. I also thought back to two world events that were necessary steps in the full adoption of the SSF Guidelines. I remembered the high level of involvement of governments, fishers’ organizations, and other stakeholders in the region during the deliberations related to small-scale fisheries that took place at the FAO World Fisheries Conference on Fisheries Management and Development in Rome in 1984. This early momentum occurred in a context of the recent adoption of the Law of the Sea Convention (UNCLOS 1982), and during the 1995 adoption by member countries of the FAO Code of Conduct for Responsible Fisheries in the context of the recommendations of United Nations Conference on Environment and Development (UNCED 1992). Identical commitment was shown by key LAC actors during the process that led to the adoption of the SSF Guidelines. This involvement and commitment should be considered an encouraging factor when looking forward to the implementation of the SSF Guidelines in countries across the region.

LAC small-scale fisheries are characterized by highly diverse ecosystems, fisheries, fishing gears, types of fishers’ organizations, and fisheries management approaches. Despite this diversity, the activity presents to a varying degree of technological, economic, social, and cultural features that give a common identity to small-scale fisheries at regional, national, and local levels in Latin America and the Caribbean.

The role historically played by small-scale fisheries (both marine and inland) in the LAC region is being increasingly considered by governments and other stakeholders as a strategic social and economic priority. In many countries in the region, small-scale fisheries make a significant contribution to the generation of employment, incomes, and foreign exchange earnings, as well as being a major source of national food supply and a cornerstone of regional food security. This contribution is especially important in the context of rural development, particularly to the food security and livelihoods of poor and isolated riparian and marine coastal communities.

The evolution of small-scale fisheries in the region in recent decades has very often been strongly influenced by external factors, such as macroeconomic policies, national economic crises, increasing international demand for fish and fish products, and the need to meet international product safety, quality, and environmental standards, among others. Large segments of the subsector showed resilience and adapted rapidly to cope with these new circumstances, thus largely succeeding in maintaining its important role in the economic and societal well-being of countries in the region.

However, in the present day, the consequences of several persistent factors make small-scale fisheries of the region vulnerable and may threaten their future sustainability. One of these factors is the continuous growth in international demand for fish and fish products that pose additional pressure over already fully exploited or overexploited fisheries resources and their ecosystems. This heightened exploitation occurs in the absence of adequate or specific fisheries policies, governance systems, and management approaches in the region. The vulnerability of the region's small-scale fisheries may also increase due to the increased frequency of natural disasters and climate change-related phenomena, which, in the absence of appropriate preparedness or mitigation and adaptation policies, threaten the sustainability of small-scale fisheries across the region. Current efforts involving both academia and ad hoc fisheries research institutions are directed to addressing such vulnerabilities.

Academia and research institutions, together with regional organizations, Civil Society Organizations (CSOs), and Non-governmental Organizations (NGOs), act as one of the three key pillars in the implementation of the SSF Guidelines. These actors have a mission to interface supportively between the other two pillars, namely governments who serve as the crucial implementing party, and fishers and their communities as the main drivers in implementation strategies. Existing and future research at various levels of social, economic, bioecological, and geographic contexts can contribute valuable inputs to improving small-scale fisheries policy formation in a collaborative interaction with the other key stakeholders. This collaboration can, in turn, lead to improved governance systems and management approaches with potential to fill the significant gaps between present realities and the changes needed in the LAC region to ensure the implementation of the SSF Guidelines.

The chapters of this book, prepared by authors from many different countries, offer invaluable theory, empirical knowledge, and methodological innovations related to the sustainability of small-scale fisheries. These case studies span a wide geographical extent of the region, while still often presenting issues and analysis at

regional, subregional, national, and local perspectives as relevant. From a thematic point of view, the studies included in this volume present information, analysis, and findings from several perspectives, such as the economic and social conditions surrounding small-scale fisheries operations, critical issues surrounding the vulnerability and risk facing small-scale fisheries, different assessment and management approaches, and issues related to governance for sustainability. The insights uncovered by the book are surely of interest to a wide audience of stakeholders and will be instrumental in enhancing the science-policy interface in many countries of the region. Most of the research currently being conducted in the region on small-scale fisheries is slowly being refocused and expanded in order to address these questions and global priorities. The findings and methods presented in this book through the lens of specific contexts of small-scale fisheries in the region could serve as inputs to help stimulate that process.

There are not many forums in the LAC region for fishery researchers to present their work and findings among a community of practice, or to exchange experiences and establish collaboration with their colleagues in the region. This book aims to serve as a starting point to make the research being conducted on LAC known to a wide audience both within and beyond the region, while also stimulating collaboration and further research among scholars across the world working on the implementation of the SSF guidelines.

This book perfectly embodies the role that the SSF Guidelines urge the academic and research community to play in the regional context of LAC. The studies included in the volume present multiple approaches to small-scale fisheries governance that are in line with what is enshrined in the document's principles. In this regard, the book may constitute a baseline for future research to be conducted in several fields in order to help define the gaps that need to be filled and provide options for how ongoing research can work alongside other key actors to advance the implementation of the SSF Guidelines in the LAC region.

Former Senior Fishery Officer of FAO
and International Consultant

Angel Alberto Gumy

Series Editor's Preface

Much of the world's food supply comes from the sea and is made available by millions of people who harvest, process, and market its products. An overwhelming majority of these people operate in the small-scale fisheries sector. At the same time, we know that marine resources and environments are under threat from overfishing, industrial pollution, and climate change. These compounding threats create great challenges for fisheries stakeholders, policymakers, civil society organizations, and academia worldwide.

The MARE Book Series by Springer includes edited volumes and monographs focusing on people and their manifold relations with the sea, as manifested in different parts of the globe. As the editors of the series, we are happy to include another important study in our portfolio. This volume is yet another contribution of the Too Big to Ignore (TBTI) research partnership that showcases its focus on applied scholarship about small-scale fisheries.

Latin America and the Caribbean, the region from which all the case studies in this volume originate, display many of the features of small-scale fisheries elsewhere, notably enormous ecological, social, and cultural diversity and complexity. However, these fisheries are neglected by policymakers, which hinder their sustainability and viability and reduce their potential to play an even more important role in job creation and food supply. It is difficult for people within the sector to break out of the poverty trap that exists in the region.

With the advent of the UN Sustainable Development Goals (SDGs) and the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication, which were endorsed by FAO member states in 2014, small-scale fisheries are now in focus as never before. In pursuit of the implementation of these important international instruments, the research community has a vital contribution to make regarding small-scale fisheries. This book, and the other publications of the MARE Series produced in collaboration with TBTI, should also be seen in this context.

This new book, much like other publications in the MARE Series, provides crucial insights into the realities and prospects of small-scale fisheries, which are essential for effective policy and governance outcomes. We are extremely pleased that the

editors Silvia Salas, María José Barragán-Paladines, and Ratana Chuenpagdee have chosen the MARE Book Series as a venue for their findings. This book deserves widespread attention in the Latin America and Caribbean region and beyond.

Tromsø and Amsterdam

Svein Jentoft and Maarten Bavinck
MARE Series editors

Acknowledgments

Viability and Sustainability of Small-Scale Fisheries in Latin America and the Caribbean speaks to contemporary issues concerning small-scale fisheries, such as current and potential market demands, social capital and their contribution to stewardship, management schemes, and governance, among others. The chapters included in this volume look at the complexity of the human-natural systems interlinked with small-scale fisheries and identify strategies to build capacity in coastal communities. Special attention is paid to the conditions and factors that either increase or decrease the weaknesses and vulnerability of this sector, in terms of livelihoods access, governance arrangements, adaptation mechanisms, and resilience strategies. The book thus presents some of the emerging challenges and threats that fishing communities and fishers are facing in the region. It is worth noting that this book fills a significant gap in up-to-date information on small-scale fisheries in the region, with many case studies closing the knowledge gaps in small-scale fisheries systems in certain areas and countries while elaborating on their current challenges, opportunities, and experiences. The book also enhances the visibility of small-scale fisheries both by assessing their current status in the region and revealing future trends expected to affect the sector. Importantly, by applying an integrative perspective and bringing together fisheries-related cases from the Atlantic, Pacific, and Caribbean subregions, as well as the Amazon River basin, the book offers ways to improve small-scale fisheries governance in the region with lessons that can be drawn for furthering the sustainability of small-scale fisheries worldwide.

The volume targets individuals, organizations, and institutions interested in small-scale fisheries issues. It is particularly relevant to managers, practitioners, and intergovernmental organizations, as well as fisheries stakeholders and civil society organizations in the Latin America and Caribbean region. This book has been shaped by a shared vision among the editors and authors around the importance of this sector to Latin America and the Caribbean, as well as the common desire to contribute to improving the viability and sustainability of small-scale fisheries in the region. We hope the book can help inspire new thinking and trigger the interest of

the reader to take actions that may lead to viable and sustainable small-scale fisheries and coastal communities.

We are grateful for the funding support of TBTI, provided by the Social Sciences and Humanities Research Council of Canada (grant number 895-2011-1011), and the Memorial University of Newfoundland, St. John's. Staff at TBTI headquarters in St. John's, particularly Vesna Kereži (TBTI Project Manager), have been tremendous in their support of the book production. Brennan Lowery has kindly helped us with the language editing. S. Salas acknowledges financial support from Fondos Mixtos-Conacyt (247043), which enabled her to participate in the meetings about the book. We also would like to thank all contributors of this volume for their positive response to the call for contributions, and for their commitment to producing high-quality, research-based case studies. We are indebted to the reviewers of the book proposal and the chapters, who generously and voluntarily dedicated part of their busy schedules to provide thoughtful and useful comments that greatly improved the overall quality of the chapters and thus of the entire volume. Finally, we appreciate the support of the MARE Publication Series editors, Professors Maarten Bavinck and Svein Jentoft, and the help of Springer staff Joseph Daniel and Fritz Schmuhl for their guidance and assistance in this publication.

Mérida, Mexico
Bremen, Germany
St. John's, Canada
October 2017

Silvia Salas
María José Barragán-Paladines
Ratana Chuenpagdee

The main focus of most technical publications on fisheries theory and practice has been on the offshore industrial fishery, but this book is concerned with our understanding of near-shore harvests and communities. While smaller in scale, inshore fisheries are more complex ecologically, and cannot be successfully managed without understanding their socioeconomic context which is of immediate relevance. Therefore, the successful management of small-scale, inshore fisheries requires the integration of fisheries within the economy of coastal communities, implying a need to understand diverse topics such as bioeconomics, ecological and environmental protection, and user rights and responsibilities. The book illustrates the complexity, diversity, and dynamics of small-scale fisheries in the Latin American and Caribbean region, and presents experiences, tools, and approaches to lead toward sustainable and viable fisheries. The reader of this compilation of essays on inshore fisheries will gain a new understanding of the range of actions, approaches, and information needed for their successful management.

John F. Caddy
International Fisheries Expert

This book provides a detailed description and analysis of the complexities and heterogeneities of small-scale fisheries in the Latin America and Caribbean (LAC) region. It also enhances the traditional knowledge and resilience of fishing communities to cope with current challenges stemming from changing ecosystems patterns, extreme climate events, market fluctuations, and governance regimes. The reported richness of diversity of ecosystems, species, fishing methods and gears, community involvement in the governance of their fisheries, information availability, and methods of fisheries analysis all play an important role in achieving sustainable and viable small-scale fisheries in the future. This book, prepared by the Too Big To Ignore project, constitutes a very valuable resource for policy makers, fisheries scientists, nongovernmental organizations, civil society organizations, and fishing communities interested in putting in place sound small-scale fisheries management strategies, research, and actions to contribute to the sustainability of small-scale fisheries and food security in the LAC region.

Juan Carlos Seijo, Professor of Fisheries Bioeconomics
Marist University of Mérida

Contents

Part I Introduction

- 1 Big Questions About Sustainability and Viability in Small-Scale Fisheries..... 3**
Ratana Chuenpagdee, Silvia Salas, and María José Barragán-Paladines
- 2 Overview of Small-Scale Fisheries in Latin America and the Caribbean: Challenges and Prospects..... 15**
Mirella de Oliveira Leis, María José Barragán-Paladines, Alicia Saldaña, David Bishop, Jae Hong Jin, Vesna Kereži, Melinda Agapito, and Ratana Chuenpagdee

Part II Issues, Challenges and Threats

- 3 Adaptive Capacity to Coastal Disasters: Challenges and Lessons from Small-Scale Fishing Communities in Central-Southern Chile..... 51**
Andrés Marín
- 4 Small-Scale Fisheries on the Pacific Coast of Colombia: Historical Context, Current Situation, and Future Challenges..... 79**
Gustavo A. Castellanos-Galindo and Luis Alonso Zapata Padilla
- 5 Cooperation, Competition, and Attitude Toward Risk of Small-Scale Fishers as Adaptive Strategies: The Case of Yucatán, Mexico..... 101**
Silvia Salas, Oswaldo Huchim-Lara, Citlalli Guevara-Cruz, and Walter Chin
- 6 Drivers of Adaptive Capacity to Climate Change in Coastal Fishing Communities of Tabasco, Mexico..... 125**
Octavio Tolentino-Arévalo, Marianna Markantoni, Alejandro Espinoza-Tenorio, and Maria Azahara Mesa-Jurado

Part III Monitoring, Management and Conservation

- 7 From Fishing Fish to Fishing Data: The Role of Artisanal Fishers in Conservation and Resource Management in Mexico.....** 151
 Stuart Fulton, Arturo Hernández-Velasco, Alvin Suarez-Castillo, Francisco Fernández-Rivera Melo, Mario Rojo, Andrea Sáenz-Arroyo, Amy Hudson Weaver, Richard Cudney-Bueno, Fiorenza Micheli, and Jorge Torre
- 8 Assessing and Managing Small-Scale Fisheries in Belize.....** 177
 Rod Fujita, Amy Tourgee, Ramon Carcamo, Lawrence Epstein, Todd Gedamke, Gavin McDonald, Jono R. Wilson, and James R. Foley
- 9 Exclusive Fishing Zone for Small-Scale Fisheries in Northern Chocó, Colombia: Pre- and Post-implementation** 197
 Viviana Ramírez-Luna and Ratana Chuenpagdee
- 10 The Challenge of Managing Amazonian Small-Scale Fisheries in Brazil** 219
 Priscila F. M. Lopes, Gustavo Hallwass, Alpina Begossi, Victória J. Isaac, Morgana Almeida, and Renato A. M. Silvano
- 11 Moving from Stock Assessment to Fisheries Management in Mexico: The Finfish Fisheries from the Southern Gulf of Mexico and Caribbean Sea** 243
 Gabriela Galindo-Cortes, Lourdes Jiménez-Badillo, and César Meiners

Part IV Socio-Economic, Markets and Livelihoods

- 12 Socioeconomic Monitoring for Sustainable Small-Scale Fisheries: Lessons from Brazil, Jamaica, and St. Vincent and the Grenadines.....** 267
 Peter Edwards, Maria Pena, Rodrigo Pereira Medeiros, and Patrick McConney
- 13 Values Associated with Reef-Related Fishing in the Caribbean: A Comparative Study of St. Kitts and Nevis, Honduras and Barbados.....** 295
 David A. Gill, Hazel A. Oxenford, and Peter W. Schuhmann
- 14 The Contribution of Small-Scale Fisheries to Food Security and Family Income in Chile, Colombia, and Peru.....** 329
 Javier Villanueva García Benítez and Alejandro Flores-Nava
- 15 Seafood Supply Chain Structure of the Fishing Industry of Yucatan, Mexico.....** 353
 Carmen Pedroza-Gutiérrez

16 Analyzing Fishing Effort Dynamics in a Multispecies Artisanal Fishery in Costa Rica: Social and Ecological System Linkages 379
 Helven Naranjo-Madrigal and Andrew B. Bystrom

17 The Embrace of *Liwa Mairin*: Lobster Diving and Sustainable Livelihoods on the Nicaraguan Miskito Coast 405
 Miguel González

Part V Communities, Stewardship, and Governance

18 Collaborative Coastal Management in Brazil: Advancements, Challenges, and Opportunities 425
 Cristiana Simão Seixas, Iain Davidson-Hunt, Daniela C. Kalikoski, Brian Davy, Fikret Berkes, Fabio de Castro, Rodrigo Pereira Medeiros, Carolina V. Minte-Vera, and Luciana G. Araujo

19 Where Small-Scale Fisheries Meet Conservation Boundaries: MPA Governance Challenges in Southern Brazil 453
 Mirella de Oliveira Leis, Ratana Chuenpagdee, and Rodrigo Pereira Medeiros

20 Supporting Enhancement of Stewardship in Small-Scale Fisheries: Perceptions of Governance Among Caribbean Coral Reef Fishers..... 473
 Rachel A. Turner, David A. Gill, Clare Fitzsimmons, Johanna Forster, Robin Mahon, Angelie Peterson, and Selina Stead

21 Existing Institutional and Legal Framework and Its Implications for Small-Scale Fisheries Development in Brazil 495
 Sérgio Macedo G. de Mattos and Matias John Wojciechowski

22 Exploring the Governability of Small-Scale Fisheries in Ecuador and Galapagos Islands Under the *Buen Vivir* Principle 513
 María José Barragán-Paladines

Part VI Conclusions

23 Drivers and Prospects for the Sustainability and Viability of Small-Scale Fisheries in Latin America and the Caribbean..... 543
 Silvia Salas, Ratana Chuenpagdee, and María José Barragán-Paladines

List of Reviewers 561

Index..... 563

Part I
Introduction

Chapter 1

Big Questions About Sustainability and Viability in Small-Scale Fisheries



Ratana Chuenpagdee, Silvia Salas, and María José Barragán-Paladines

Abstract Like elsewhere around the world, small-scale fisheries in Latin America and the Caribbean are highly diverse and complex, thus posing great challenges to governance. Coupled with these characteristics are the various changes that small-scale fisheries are exposed to, including climate-induced changes, environmental variability, and market fluctuation. Several tools and approaches have been used to manage small-scale fisheries in the region and lessons from their application provide a strong basis for the discussion about what needs to be done in light of these changing conditions. The focus on the viability and sustainability of small-scale fisheries, which is the topic of the book, aligns with the objectives of the international instruments such as *The Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries* and the Sustainable Development Goals. The chapter provides the rationale for the examination of viability and sustainability in small-scale fisheries in Latin America and the Caribbean and introduces the case studies covered in the book.

Keywords Small-scale fisheries · Viability · Sustainability · Governance · SSF Guidelines · Sustainable Development Goals · Latin America and the Caribbean

R. Chuenpagdee (✉)

Department of Geography, Memorial University of Newfoundland, St. John's, Canada
e-mail: ratana@mun.ca

S. Salas

Marine Resources Department, CINVESTAV Mérida, Mérida, Yucatán, México
e-mail: ssalas@cinvestav.mx

M. J. Barragán-Paladines

Development and Knowledge Sociology-Social Science Department, Leibniz Centre for Tropical Marine Research (ZMT), Bremen, Germany
e-mail: mariaj.barraganp@leibniz-zmt.de

1.1 Introduction

According to the Sea Around Us Project, small-scale fisheries in Latin America and the Caribbean contribute about 11% to the global small-scale fisheries catch and about 12% of total market value (Pauly and Zeller 2016). These figures may seem low in comparison with other regions, like Asia and Oceania (52%) and Europe (13%). However, 74% of all catches in Latin America and the Caribbean come from small-scale fisheries, which is higher than other regions (70% in Asia and Oceania and 24% in Europe). In other words, small-scale fisheries in the Latin America and Caribbean region are the predominant sector and thus require much greater policy and research attention in order to foster and secure their viability and sustainability.

A large body of literature has been written about numerous aspects of fisheries in the Latin America and Caribbean region, with a growing contribution of research and discussion focusing specifically on small-scale fisheries. Because some of these studies are written in Spanish, French, and Portuguese, they have not been cited as highly as those in English (Table 1.1). Also, as shown in Fig. 1.1, when compared to ecology and economics (in English and other languages), less is known about the social aspects of small-scale fisheries, such as their contribution to viable livelihoods, food security, poverty alleviation, and sources and conditions of their vulnerability. Research into these questions can complement the strong foundation of natural science knowledge, thus leading to a more comprehensive understanding about fisheries systems. This interdisciplinary approach is called for in the United Nations Food and Agriculture Organization (FAO) *Code of Conduct for Responsible Fisheries* (FAO 1995).

The importance of a holistic and integrated approach to governing fisheries is also one of the key principles promoted in the *Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty*

Table 1.1 Search results for literature in scientific journals: ISI Web of Knowledge, SCOPUS, Google Scholar, and Latindex

Source of search	Search keywords	# of hits	Language
ISI Web of Sciences apps.webofknowledge.com	“Small-scale fisheries”	2072	English
	“Latin America” + “small-scale fisheries”	22	
SCOPUS www.scopus.com	“Small-scale fisheries”	2113	English
	“Latin America” + “small-scale fisheries”	198	
Google Scholar scholar.google.com	“Small-scale fisheries”	20,100	English, Spanish, Portuguese, and French
	“Latin America” + “small-scale fisheries”	2440	English, Spanish, Portuguese, and French
Latindex http://www.latindex.org	“Fisheries”	33	Spanish and Portuguese

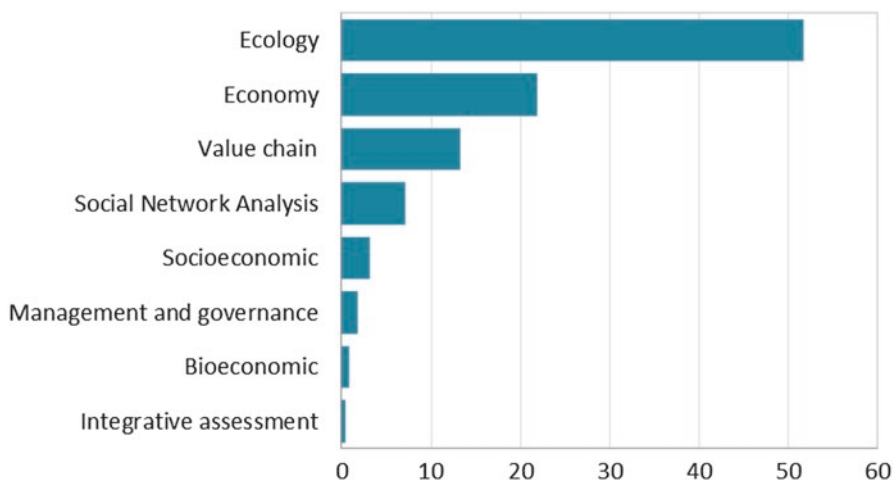


Fig. 1.1 Main research topics on small-scale fisheries in the Latin America and Caribbean region between 1950 and 2015. (Sources: ISI Web of Knowledge, SCOPUS, Google Scholar and LatIndex)

Eradication (SSF Guidelines) (FAO 2015). The adoption of the SSF Guidelines in 2014, 25 years after the *Code of Conduct for Responsible Fisheries* was passed, marks an important moment in the global discourse on fisheries governance. Unlike other international instruments, the SSF Guidelines were developed through a ‘bottom-up’ process, with fisheries-related civil society organizations (CSOs) playing a critical role in initiating the discussion, producing drafts of the guidelines, and conducting consultation to solicit inputs from fishers and fishers’ organizations in various locations around the world.

The SSF Guidelines contain several principles that speak to the importance of small-scale fisheries and the need to promote a sustainable and viable future for this sector. These principles center around fundamental elements like human rights and dignity, nondiscrimination, and equity and equality, with an emphasis on gender. They also refer to major governance principles such as transparency and accountability, consultation and participation, rule of law, and a holistic and integrated approach. The SSF Guidelines also promote the examination of diverse values and the contribution of small-scale fisheries to culture, social responsibility, feasibility, social and economic viability, and social, economic, and environmental sustainability. The discussion about the SSF Guidelines and the deliberation about these principles, along with the recognized research gaps stated above, inspired the creation of this edited volume.

As suggested by Jentoft (2014), the implementation of the SSF Guidelines will require commitment and effort from all stakeholders. Recent research conducted by Too Big To Ignore: Global Partnership for Small-Scale Fisheries Research (TBTI; toobigtoignore.net) covers various aspects of small-scale fisheries and contributes to supporting the implementation of the SSF Guidelines. For instance, through more

than 30 case studies around the world, Jentoft and Chuenpagdee (2015) offer lessons about issues affecting small-scale fisheries governance and highlight how several countries are moving away from hierarchical governance models to participatory and co-governance, while some are in a hybrid form or in transition. In Jentoft et al. (2017), another 30 case studies directly examine challenges and opportunities in the implementation of the SSF Guidelines. Finally, Johnson et al. (2017) bring the discussion to another level with the focus on values and well-being of small-scale fisheries, mainly with examples from Asia. These three volumes speak to the need to broaden the research scope and policy perspectives to recognize the existing contribution of small-scale fisheries and foster their potential to address global concerns related to ecosystem health, food security, and poverty alleviation.

The current volume adds to this discourse by focusing on the viability and sustainability of small-scale fisheries and fishing communities, using case studies in the Latin America and Caribbean region as illustrations. It begins with the observation that the high diversity, complexity, and dynamics of small-scale fisheries, along with the wide range of spatial distribution and jurisdiction, pose significant challenges to understanding the necessary conditions for viable and sustainable fisheries in the region. These characteristics can be found within many countries and across the region overall. For example, several ecosystem types exist in Latin America and the Caribbean, from the volcanic environments in Galapagos Islands to tropical rainforests in the Amazonian River basin. The coastal regions of the Atlantic, Pacific, and Caribbean are also diverse in geophysical characteristics, habitats, and biodiversity, giving rise to a variety of demersal, pelagic, and benthic fisheries with different species compositions (Salas et al. 2007, 2011). Similarly, the Latin America and Caribbean region is highly diverse and complex in terms of languages, historical and cultural attributes, economic and social contexts, and institutional and governance arrangements (Orensanz et al. 2005; Alcalá-Moya 2011). All of these features make small-scale fisheries difficult to govern, as also suggested by Salas et al. (2011) in an early volume of country-level studies that focused on challenges in the assessment and management of coastal fisheries in the region. Current global trends (e.g., market changes, climate change, etc.) impose a greater challenge that must be addressed to understand and govern small-scale fisheries in the region, and in order to identify factors that can lead to viable and sustainable fisheries (Defeo et al. 2013; Crona et al. 2015).

1.2 The Emphasis on Sustainability and Viability

Sustainability has long been on the policy and research agenda. However, sustainability in the context of small-scale fisheries is a recent topic providing a major foundation for the SSF Guidelines and has been discussed at various venues. The United Nations Sustainable Development Goals (SDGs) include concerns about sustainable fisheries in Goal 14, which aims to conserve and sustainably use the oceans, seas, and marine resources for sustainable development (UN 2017). Specific reference to small-scale fisheries is made in Target 14b under this goal, which speaks to the need to provide access for small-scale fishers to marine

resources and markets (UNEP 2016). The global indicator for this target is the progress that countries make in their application of governance frameworks (e.g., legal, regulatory, policy, and institutional), in ways that recognize and protect access rights for small-scale fisheries (UN 2017). In effect, SDG 14 and specifically Target 14b present a unique opportunity to combine thinking around sustainability and viability, rather than looking at these two topics separately. In this view, one can argue that for small-scale fisheries to be sustainable, small-scale fishing communities must have viable livelihoods. Likewise, for small-scale fishing communities to be viable, fisheries need to be sustainable.

Making small-scale fishing communities viable while maintaining sustainable fisheries aligns with the objectives of the SSF Guidelines. In discussing responsible fisheries and sustainable development, the SSF Guidelines include various domains that promote community viability such as social development, employment and decent work, and value chain, post-harvest and trade. However, achieving both the sustainability and viability of small-scale fisheries is a big challenge. Programs, practices, and policies to promote their sustainability and viability are currently developed mostly based on sets of quantitative criteria or indicators. Few metrics are available to evaluate viability, except in the context of financial performance (Schuhbauer and Sumaila 2015a). Within TBTI, a research cluster on economic viability has been working on developing and testing an indicator-based framework to assess viability from both economic and social perspectives (Schuhbauer and Sumaila 2015b). However, a framework to look at the interplay between viability and sustainability is currently not available. This book aims to take a step in that direction.

1.3 About This Book

The overall aim of this book is to examine the extent to which small-scale fisheries performance can be improved along the entire fish chain (i.e., pre-harvest, harvest, and post-harvest). By incorporating conditions and challenges, markets and socio-economic attributes, and governance systems into the analysis of the case studies, this volume reflects on how such improvements can lead to increased viability and help to secure the sustainability of fishing communities and resources. The book presents and synthesizes findings and lessons learned from the case studies, along the wide range of spatial distribution and jurisdictional characteristics of fisheries in the region. These learnings are intended as a basis for policy formulation and the development of management strategies that can help foster the implementation of the SSF Guidelines and the achievement of the SDGs.

Specifically, the main questions concerning the sustainability and viability of small-scale fisheries raised in the book revolve around the following issues:

1. The diversity and significance of issues, challenges, and threats faced by small-scale fisheries in the Latin America and Caribbean region
2. The conditions and factors in different small-scale fisheries contexts that foster or inhibit viability and sustainability

3. The role and adaptive capacity of communities and fisherfolks in reducing vulnerability and securing sustainable livelihoods
4. The role of appropriate institutional and legal frameworks, policy interventions, and alternative governance models in promoting viability and sustainability

The book consists of 23 chapters, 20 of which are case studies related to 15 countries and Small Island Developing States (SIDS) in the Latin America and Caribbean region (Fig. 1.2). These 20 case studies cover a variety of ecosystems (e.g., marine, coastal, and freshwater) in the Pacific, Atlantic, Caribbean, and Gulf of Mexico, as well as the Amazonian River Basin. The diversity of the case studies is reflected in both bioecological and socioeconomic contexts, including a couple of examples from indigenous small-scale fisheries. While the majority of the case studies are specific to small-scale fisheries in certain locations, a few chapters present comparative case studies and broader analyses.

The book is organized into six parts. The first and last parts are the introduction and conclusion. The four main parts consist of collections of case studies related to (1) issues, challenges, and threats; (2) monitoring, management, and conservation; (3) socioeconomics, markets, and livelihoods; and (4) communities, stewardship, and governance. In addition to this chapter, *Part I* includes Chap. 2 (Leis et al. [a]), which presents a regional overview of the status, challenges, and potentials of small-scale fisheries of all countries in the Latin America and Caribbean region using national-level data and statistics, literature, and the TBTI information system (ISSF 2017).

Part II contains four chapters that illustrate issues and threats that add to the vulnerability of small-scale fisheries and demonstrate how communities cope with these stresses. Chap. 3 (Marín) presents an example from central-southern Chile, describing how small-scale fishing communities deal with coastal disasters. Chapter 4 (Castellanos-Galindo and Zapata) tells the story of small-scale fishing communities on the Pacific Coast of Colombia, looking at what happened in the past that threatened their viability and sustainability, and discussing the challenges that lie ahead. In Chap. 5, Salas et al. discuss the adaptive strategies of small-scale fishers in the Yucatán coast of Mexico as the communities are exposed to risks and resource use competition. Also in the Gulf of Mexico, Chap. 6 (Tolentino-Arévalo et al.) offers insights about how coastal fishing communities in Tabasco state, Mexico, cope and adapt to climate change while dealing with the oil industry.

Part III focuses on the roles of management, including monitoring and assessment, and how stakeholders are involved in promoting conservation and sustainability. This section begins with a description of how small-scale fishers can participate in conservation and stewardship by taking part in data collection and knowledge production about fisheries (Chap. 7; Fulton et al.). Fujita et al. (Chap. 8) present the situation in Belize in which new initiatives are introduced to deal with the risk of overfishing and overcapitalization in fisheries. In Chap. 9, a pre- and post-analysis is presented by Ramírez-Luna and Chuenpagdee to look at the origin and implementation of a management system called “exclusive fishing zone” and how it affects small-scale fisheries. Chapter 10 (Lopes et al.) offers an account of



Fig. 1.2 The Latin America and Caribbean countries and states; blue denotes the 15 countries and states included in the case studies. (Source: M. Agapito, TBTI)

how Amazonian small-scale fisheries are managed, along with the key management challenges in this fishery. Finally, Galindo-Cortes et al. (Chap. 11) propose a shift from stock assessment to fisheries management and governance to achieve viability and sustainability goals.

Moving to options and opportunities for small-scale fisheries in enhancing viability and securing sustainability, *Part IV* presents examples of the interconnectivity between socioeconomic, market, livelihoods, viability, and sustainability. Beginning with Chap. 12, Edwards et al. introduce the Socioeconomic Monitoring Initiative for Coastal Management (SocMon) as a framework to assess the socio-ecological dynamics of small-scale fisheries and illustrate its applicability in Brazil, Jamaica,

and the Grenadines Islands. Gill et al. (Chap. 13) present another comparative case study, this time looking at St. Kitts and Nevis, Honduras, and Barbados to analyze values associated with reef-related fisheries in these contexts. Similarly, Benítez and Flores-Nava (Chap. 14) discuss the contribution of small-scale fisheries to food security and family income in Chile, Colombia, and Peru. Next, Chap. 15 shifts the focus to the post-harvest part of the fish chain, which is often not discussed. However, as argued by Pedroza-Gutiérrez (Chap. 15), the way the supply chain is organized can help improve viability. The last two chapters in this part focus on dynamics. Naranjo-Madrigal and Bystrom (Chap. 16) analyze the dynamics of fishing efforts in Costa Rica and explore the linkages between social and ecological systems. In Chap. 17, González presents a rich description of the social dynamics in the Nicaraguan Miskito Coast, illustrating how indigenous lobster divers cope with external market pressure and the consequences on the resources.

The last set of case studies (*Part V*) speaks to the key elements for viability and sustainability related to community, stewardship, and governance. Chapter 18 (Seixas et al.) describes a collaborative governance system employed in Brazil and discusses the advantages and challenges associated with its implementation. Also in Brazil, Leis et al. [b] (Chap. 19) present a case for involving fishers in conservation and stewardship efforts, using the top-down establishment of a marine protected area as an example. Turner et al. (Chap. 20) offer another illustration of how stewardship initiatives affect governance perceptions among coral reef fishers in Barbados, Belize, Honduras, and St. Kitts and Nevis. Chapter 21 returns to Brazil with a study by Mattos and Wojciechowski, who analyze the existing institutions and legal framework used to govern small-scale fisheries and their implications on sustainable development. Finally, Barragán-Paladines (Chap. 22) brings the discussion about governance to the meta-level, examining how principles like *Buen Vivir* (i.e., good way of living) affect the viability and sustainability of small-scale fishing people in Ecuador and the Galapagos Islands.

In the conclusion section of the book (*Part VI*), Salas et al. (Chap. 23) summarize experiences and lessons from the case studies presented in the book, highlighting examples of the challenges facing small-scale fisheries in different countries in the Latin America and Caribbean region. It also shows how these challenges affect their viability and sustainability and how these difficulties have been addressed. Based on these insights, the chapter concludes with key interventions, tools, and approaches that would be desired to improve governance for viable and sustainable future of small-scale fisheries in the Latin America and Caribbean region.

The 20 case studies illustrate the diversity, complexity, and dynamics of small-scale fisheries in many countries and SIDS in the Latin America and Caribbean region. Some studies incorporate the complexity of natural, social, and cultural assets, arguing for the rights of small-scale fishers, including indigenous groups, for access to resources and markets. Other cases deal with the normative and formal instruments used to govern small-scale fisheries, showing both success stories and challenges. In some instances, the sources of vulnerability and the barriers to viability and sustainability are made explicit, with examples of external pressures, such as

market fluctuation, related to environmental conditions and climate variability and postharvest situations. Many chapters recognize the important roles that the governance systems (including process, structure, institutional arrangements, and regulatory and legal frameworks) play in promoting viability and securing sustainability for small-scale fisheries.

The contributions of the 20 case studies and the two synthesis chapters illustrate the importance of an in-depth understanding of the entire small-scale fisheries systems from ecological, economic, social, and governance perspectives. These case studies also highlight the importance of contextualizing this understanding in terms of the threats and challenges affecting their viability and exploring opportunities for improving their conditions. The lessons and experiences presented in this volume provide options and alternatives that are worthy of inclusion in the formulation of policies and intervention for sustainable small-scale fisheries. They also help pave the way for the implementation of the SSF Guidelines in the Latin America and Caribbean region and in promoting the achievement of the SDGs, not only in the context of SDG14 but also regarding other goals such as alleviating poverty (SDG1), ending hunger (SDG2), good health and well-being (SDG3), and gender equality (SDG5), to name a few. As illustrated here, fisheries policies and practices need to be holistically conceived and integrative in order to promote the livelihoods and well-being of small-scale fisheries systems while protecting the health of resources and the aquatic environment.

The small-scale fisheries sector in Latin America and the Caribbean is far from homogenous. In fact, there are a broad range of similarities and differences within the small-scale fisheries in this region which, when compared to small-scale fisheries in other regions of the world, appear to be even more complex. These diverse experiences at both the regional and global scales offer to us a great opportunity to share and exchange lessons and perspectives that may be useful for fostering a broader conversation about the future of the world's small-scale fisheries.

Acknowledgments Both this chapter and the book itself are the product of the Too Big To Ignore: Global Partnership for Small-Scale Fisheries Research (TBTI), funded through partnership grant # 895-2011-1011 by the Canadian Social Sciences and Humanities Research Council (SSHRC). We also thank Eva Coronado for the literature review and acknowledge FOMIX (2014-C17-247043) for providing financial support to Silvia Salas for her travel to Canada while she was working on the book.

References

- Alcalá-Moya G (ed) (2011) *Pescadores en América Latina y el Caribe: espacio, población, producción y política*, volúmenes I y II. Universidad Nacional Autónoma de México, Facultad de Ciencias-Unidad Multidisciplinaria de Docencia e Investigación-SISAL, Yucatán, México
- Crona BI, Van Holta T, Petersson M, Daw TM, Buchary E (2015) Using social-ecological syndromes to understand impacts of international seafood trade on small-scale fisheries. *Glob Environ Chang* 35:162–175

- Defeo O, Castrejón M, Ortega L, Kuhn AM, Gutiérrez NL, Castilla JC (2013) Impacts of climate variability on Latin American small-scale fisheries. *Ecol Soc* 18(4):30. <https://doi.org/10.5751/ES-05971-180430>
- FAO (2015) Voluntary guidelines for securing sustainable small-scale fisheries in the context of food security and poverty eradication. Rome, United Nations Food and Agriculture Organization, FAO
- FAO (Food and Agriculture Organization of the United Nations) (1995) Code of conduct for responsible fisheries. FAO, Rome
- ISSF. (2017). Information system on small-scale fisheries. Issfcloud.toobigtoignore.net. Accessed 31 Aug 2017
- Jentoft S (2014) Walking the talk: implementing the international voluntary guidelines for securing sustainable small-scale fisheries. *Mar Stud* 13:16
- Jentoft S, Chuenpagdee R (eds) (2015) Interactive governance for small-scale fisheries: Global reflections. MARE Publication series 13. Springer, Cham
- Jentoft S, Chuenpagdee R, Barragán-Paladines MJ, Franz N (eds) (2017) The small-scale fisheries guidelines: Global implementation. MARE Publication series 14. Springer, Cham
- Johnson DS, Acott TG, Stacey N, Urquhart J (eds) (2017) Social wellbeing and the values of small-scale fisheries. MARE Publication series 17. Springer, Cham
- Orensanz JM, Parma AM, Jerez G, Barahona N, Montecinos M, Elías I (2005) What are the key elements for the sustainability of 'S-fisheries'? Insights from South America. *Bull Mar Sci* 76:527–556
- Pauly D, Zeller D (eds) (2016) Global atlas of marine fisheries – a critical appraisal of catches and ecosystem impacts. Island Press, Washington D.C.
- Salas S, Chuenpagdee R, Seijo JC, Charles A (2007) Challenges in the assessment and management of small-scale fisheries in Latin America and the Caribbean. *Fish Res* 87(1):5–16
- Salas S, Chuenpagdee R, Seijo JC, Charles A (2011) Coastal fisheries of Latin America and the Caribbean. FAO fisheries and aquaculture technical paper 544. FAO, Rome
- Schuhbauer A, Sumaila UR (2015a) Economic viability and small-scale fisheries: a review. *Ecol Econ* 124:69–75
- Schuhbauer A, Sumaila UR (2015b) Assessing the economic viability of small-scale fisheries: an indicator-based framework. University of British Columbia, Fisheries Economic Research Unit, and Too Big To Ignore, Vancouver
- Schuhbauer, A, Sumaila UR (2016) Economic viability and small-scale fisheries - A review. *Ecological Economics*, 124(C):69–75
- UN (2017). Sustainable Development Goals. Sustainable development knowledge platform, Department of Economic and Social Affairs, United Nations. <https://sustainabledevelopment.un.org/>. Accessed 15 Sept 2017
- UNEP (2016) GEO-6 regional assessment for Latin America and the Caribbean. United Nations Environment Programme, Nairobi

Ratana Chuenpagdee is a professor at the Department of Geography, Memorial University of Newfoundland, St. John's, Canada. She held the position of a Canada Research Chair in Natural Resource Sustainability and Community Development at Memorial University from 2006 to 2016. Her research emphasizes interdisciplinary approaches to coastal, fisheries, and ocean governance, focusing particularly on small-scale fisheries, marine protected areas, community-based management, and food security. She has worked in several countries including Cambodia, Malawi, Mexico, Spain, Thailand, and Canada. Dr. Chuenpagdee is a director of the Too Big To Ignore (TBTI) Global Partnership for Small-Scale Fisheries Research and one of the editors of the 2017 book 'The Small-Scale Fisheries Guidelines: Global implementation'.

Silvia Salas is a professor at the Marine Resources Department at Cinvestav Unidad Merida, Mexico. Her background is in Marine Science (Cinvestav, MSc) and Resource Management and Environmental Studies (University of British Columbia, Canada, PhD). She has competence in fisheries bio-economics and management, fleet dynamics and fishing strategies, vulnerability, and risk perception with an emphasis on small-scale fisheries. She has participated as a consultant in several FAO workshops and has collaborated as a member of the advisory committee of the WECAF Region (FAO). Currently she is the representative of Latin America in the IIFET Board Committee and represents Mexico in NAAFE Board Committee. She is also one of the collaborators in the TBTI partnership.

María José Barragán-Paladines obtained a PhD in Geography at Memorial University of Newfoundland in St. John's, Canada. Her undergraduate and master's research at the Technical University of Munich (TUM) focused on Marine Protected Areas (MPAs) and marine wildlife management. Her PhD research employed the interactive governance approach, with a specific focus on MPAs, examining the governability of the Galapagos Marine Reserve. She collaborates with TBTI and is currently a post-doctoral researcher in the "Development and Knowledge Sociology" at the Leibniz Centre for Tropical Marine Research in Bremen, Germany. Her research interests include small-scale fisheries sustainability, fishing community viability, food security from the marine perspective, and marine resource governance.

Chapter 2

Overview of Small-Scale Fisheries in Latin America and the Caribbean: Challenges and Prospects



Mirella de Oliveira Leis, María José Barragán-Paladines, Alicia Saldaña, David Bishop, Jae Hong Jin, Vesna Kereži, Melinda Agapito, and Ratana Chuenpagdee

Abstract The importance of small-scale fisheries in Latin America and the Caribbean has been widely recognized in terms of income, livelihoods, and food security for more than two million people. The highly diverse ecosystems and multiple species found within this region determine the variety of fishing techniques, gears, and target species, as discussed in this chapter. These diverse and complex characteristics pose challenges to the region's governing systems, which may lack the technical and financial resources to cope with the numerous resulting management and governance challenges. These pressures are further exacerbated when fisheries assessment and monitoring are poorly conducted, adding uncertainty in relation to the status of the ecosystem and fish stocks. Small-scale fisheries activities thus have become vulnerable in the face of various challenges in Latin America and the Caribbean. Current efforts to enhance small-scale fisheries viability and sustainability in Latin America and the Caribbean include the adoption of innovative management approaches that focus on the entire ecosystems rather than on single species and that acknowledge the concerns of local stakeholders in decision-making through strategies such as collaboration with the government in co-management arrangements. Although many of these co-management arrangements

M. de Oliveira Leis (✉) · A. Saldaña · D. Bishop · J. H. Jin · V. Kereži
M. Agapito · R. Chuenpagdee
Too Big To Ignore Global Partnership for Small-Scale Fisheries Research, Memorial
University of Newfoundland, St. John's, NL, Canada
e-mail: mirella.deoliveiraleis@mun.ca; asaldanamill@mun.ca; d.bishop@mun.ca;
toobigtoignore@mun.ca; mta557@mun.ca; ratanac@mun.ca

M. J. Barragán-Paladines
Development and Knowledge Sociology-Social Science Department, Leibniz Centre for
Tropical Marine Research (ZMT), Bremen, Germany
e-mail: mariaj.barraganp@leibniz-zmt.de

in the region are still nascent, this chapter highlights that fishers and their organizations play a significant role in responsible resource governance through exercising ecosystem stewardship.

Keywords Latin America and the Caribbean · Small-scale fisheries · Governance · Viability · Sustainability · Environmental stewardship

2.1 Introduction

Small-scale fisheries in the Latin America and Caribbean region can be traced back to pre-colonization periods (i.e., before the fifteenth century) (Diegues 2008; Bray 2012; Rostworowski 2015). At the time, the inhabitants of the Americas relied heavily on fishing resources for subsistence. Historically, the development of fishing practices and knowledge about resources and fishing grounds were passed on from elders to younger generations by different strategies, some of which are still present in some communities (De Madariaga 1969). After colonization, the monetary value attributed to fish and its trade triggered the shift from a subsistence-based to commercial fishery. This change opened space for fishing enterprises that actively searched to expand their fishing effort in the region, particularly during the 1980s (Allsopp 1985; Tassara 1994; Salas et al. 2007). This expansion coincided with liberal political agendas combined with neoliberal practices such as financialization, deregulation, and privatization, among other drivers of change (Pinkerton 2017). In the same vein, nation states made a major push to develop industrial fisheries and increase fishing fleets, arguing that such development would generate jobs and help secure food availability for coastal communities (Chuenpagdee et al. 2011).

According to FAO (2016), almost 90% of all motorized fishing vessels in the Latin America and Caribbean region are considered small scale, or less than 12 m in length. Despite the recognition that there is no single agreed-upon definition of small-scale fisheries (FAO 2015), and that the criteria used in Latin America and the Caribbean to define small-scale fisheries vary remarkably across countries, small-scale fisheries are generally characterized by a small number of fishing crew (3–5 fishers), are largely community-based, operate in nearshore areas, use low levels of fishing technology, and have limited capital investment (Salas et al. 2007). Further, they typically target multiple species and use a large diversity of gears and fishing techniques that vary spatially and temporally as determined by the dynamics of resource availability (Salas et al. 2007). Small-scale fisheries in the region are deeply linked to the history and culture of local fishing communities and have a strong influence on the regional economy through the generation of employment, income, and livelihoods.