

Deep-Sea Fisheries of India

Volume 1



Dr. G. Sudhakara Rao

Foreword by
Dr. G. Luther

DEEP-SEA FISHERIES OF INDIA

DEEP-SEA FISHERIES OF INDIA

Vol. 1

DR. G. SUDHAKARA RAO

M.Sc., Ph.D.

Foreword by

DR. G. LUTHER

M.Sc., Ph.D., FMBAI

Former Head of Pelagic Fisheries Division
Central Marine Fisheries Research Institute



B.R. PUBLISHING CORPORATION

DELHI - 110 052

Cataloging in Publication Data--DK

Courtesy: D.K. Agencies (P) Ltd. <docinfo@dkagencies.com>

Sudhakara Rao, G.

Deep-sea fisheries of India / G. Sudhakara Rao ; foreword
by G. Luther.

p. cm.

Includes bibliographical references (p.)

Includes index.

ISBN 10: 8176466565

ISBN 13: 9788176466561

1. Big game fishing--India. 2. Fisheries--India. 3. Shrimp
fisheries--India. 4. Fishery management--India. I. Title.

DDC 639.277 095 4 22

Printed and Published by:

B.R. Publishing Corporation

425, Nimri Colony

Ashok Vihar, Phase-IV

Delhi - 110 052

Ph.: 011-23259196, 011-23259648

e-mail: *brpc@vsnl.com*

First Published, 2009

© Publisher

ISBN 10: 81-7646-656-5

ISBN 13: 978-81-7646-656-1

The contents, facts, views and analysis in this book are entirely the responsibility of the Author. All rights including the right to translate or to reproduce this book or parts thereof except for brief quotations, are reserved.

Contents

<i>Foreword</i>	ix
<i>Preface</i>	xi
<i>Acknowledgements</i>	xiii
<i>Introduction</i>	xv
1. Estimation of Potential Fishery Resources	1
1.1 Northwest Coast	3
1.1.1 The Operations of New India Fisheries Vessels	3
1.1.2 Surveys by Government of India Vessels	4
1.1.3 Surveys by Freezer Trawler M.T. Murena	6
1.1.4 Surveys along the Gujarat Coast	9
1.2 Southwest Coast	11
1.2.1 Indo-Norwegian Project	12
1.2.2 Surveys by Offshore Fishing Stations	17
1.2.3 Exploratory Fishing for Tunas	23
1.3 Southeast Coast	25
1.3.1 The Studies of Tuticorin Station	26
1.3.2 Surveys by Madras Base	28
1.3.3 The Surveys of INP from Mandapam	32
1.4 Northeast Coast	33
1.4.1 Investigations from Visakhapatnam Base	35
1.4.2 Investigations of Calcutta Base	40
1.4.3 Operations of Paradeep Base	41
1.5 Andaman and Nicobar Islands	41
1.5.1 Bottom Trawl Survey	42
1.5.2 Hand Line Fishing for Rock Cods	48
1.5.3 Bottom Set Longlining	48
1.5.4 Pelagic Resources Survey	49
1.6 Lakshadweep Islands	49
1.6.1 Tuna Longline Survey	51
1.6.2 Bottom Trawl Survey	51
1.7 FORV <i>Sagar Sampada</i> , A National Facility	51
1.7.1 Northwest Coast	52
1.7.2 Southwest Coast	55
1.7.3 Southeast Coast	61

1.7.4	Northeast Coast	64
1.7.5	Andaman and Nicobar Islands	68
1.8	Stock Estimates	70
1.8.1	Methodology and Approach	72
1.8.2	Potential Stock Estimates	73
2.	Prawn Fishery of the Northeast Coast	77
2.1	Prawn Landings along the Northeast Coast	78
2.2	Prawn Landings in West Bengal	79
2.3	Prawn Fishery of Orissa	80
2.3.1	Small Trawler Fishery at Paradeep	81
2.4	Prawn Fishery of Andhra Pradesh	83
2.4.1	Small Trawler Fishery at Kakinada	88
2.4.2	Prawn Fishery at Visakhapatnam	115
2.5.	Prawn Fishery of the Large Trawlers	137
2.5.1	The Fishing Fleet and its Operation	138
2.5.2	Data Collection and Analysis	140
2.5.3	Catch and Effort	141
2.5.4	Catch Composition	142
2.5.5	Seasonal Variations	143
2.5.6	Depth-wise Abundance of Prawns	146
2.5.7	Abundance of Prawns in Different Areas	148
2.5.8	Economic Analysis	151
2.6	Prawn Fishery of Mini Trawlers	154
2.7	Maximum Sustainable Yield	154
3.	Bio-economic Analysis of the Northeast Coast Demersal Fisheries	157
3.1	Data Processing	158
3.1.1	Input Data for Bio-economic Modeling	160
3.1.2	Biological Input Parameters	162
3.1.3	Tuning of the Biological Sub-model	165
3.1.4	Economic Input Data for the Model	165
3.2	Results of the Bio-economic Analysis	169
4.	Diversification of Deep-Sea Fishing Vessels	173
4.1	Deep-sea Lobster Fishing	173
4.2	The Guidicelli Report	174
4.3	Monofilament Longlining	174
4.4	The Proposal of AIFI in 1993	176
4.5	Trawling Operations in Myanmar	177
4.6	Trawling Operations in Indonesia	177
4.7	Modification of Trawlers for Longlining	178
5.	Financing the Deep-Sea Fishing Fleets	181
5.1	Shipping Development Fund Committee	182
5.2	Formation of SCICI	183
5.2.1	Financial Assistance from SCICI	183

5.2.2	Terms and Conditions of SCICI Assistance	184
5.2.3	SCICI's Approach to Project Financing	185
5.3	Necessity of a Fisheries Bank	189
5.4	Plight of Fishing Vessel Building Yards	190
5.5	Defaulting by Companies	190
5.5.1	Rescheduling of Loans	191
5.5.2	Working Capital Loans	191
5.5.3	Oil Subsidy	192
5.5.4	Trawler Development Fund Scheme	192
5.5.5	Take over of Vessels by SCICI	193
5.5.6	Deep-Sea Fishing Company by SCICI	195
5.6	Rehabilitation of Deep-Sea Fishing Industry	195
5.6.1	Finance for Diversification	196
5.7	General Remarks	197
6.	The Deep-Sea Prawn Fishery	199
6.1	Exploratory Surveys by INP Vessels	199
6.1.1	The Trawling Grounds	199
6.1.2	Operations and the Catches	200
6.1.3	Area-wise Catch Distribution	201
6.2	Exploratory Surveys by FORV <i>Sagar Sampada</i>	207
6.2.1	Details of Fishing	207
6.2.2	Catches and the Catch Rate	207
6.2.3	Species Composition	208
6.2.4	Biological Observations	209
6.3	Studies by Fishery Survey of India	211
6.4	Operations of Chartered Trawlers	211
6.4.1	Distribution and Abundance of Deep-Sea Prawns	213
6.4.2	Fishing Grounds	214
6.4.3	Catch Per Unit of Effort	214
6.4.4	Seasonality in Fishing Effort	214
6.4.5	Seasonal Variation in Catch Rate	215
6.5	Deep-Sea Prawn Fishery of Kerala	215
6.5.1	Modification to the Gear	215
6.5.2	Area of Fishing	216
6.5.3	The Fishery in 1999-2000	216
6.5.4	The Fishery in 2000-2001	219
6.5.5	Biological Characteristics	221
6.6	Deep-Sea Prawn Fishery at Mangalore	229
6.7	The Deep-Sea Prawn Fishery at Tuticorin	230
6.7.1	Catch and Effort	230
6.7.2	Species Composition	232
6.7.3	Seasonal Variations	232
6.7.4	Size Composition	233
6.8	Deep-Sea Prawn Fishery along the Coromandel Coast	233
6.8.1	Catch and Catch Composition	235

6.8.2	Catch Rate	235
6.8.3	Size Composition	235
6.9	Management of the Deep-Sea Prawn Fishery	236
7.	Deep-Sea Lobster Fishery of the Southwest Coast	237
7.1	Surveys by INP during 1967 and 1968	238
7.1.1	Catches	238
7.1.2	Size Composition	238
7.1.3	Reproduction	239
7.2	INP Surveys during 1969-71	240
7.2.1	Fishing Operations	241
7.2.2	Depth-wise Distribution	241
7.2.3	Seasonal Distribution	242
7.2.4	Size Distribution	242
7.2.5	Sex and Maturity	242
7.2.6	Processing	242
7.3	Surveys by Fishery Survey of India	243
7.4	Exploratory Surveys by <i>Sagar Sampada</i>	244
7.4.1	Details of Fishing	244
7.4.2	Catches and Catch Rates	245
7.4.3	Biological Characteristics	247
7.5	Commercial Operations	249
7.5.1	Operations of Large Trawlers	251
7.5.2	Operations of Medium Trawlers	252
7.6	Estimation of Resource Potential	254
7.7	Management Measures	254