InSight Bulletin: A Multidisciplinary Interlink International Research Journal
Peer Reviewed International, Open Access Journal.
ISSN : 3065-7857 / Website: https://ibrj.us / Volume-2, Issue-8 / August - 2025

Original Article

Sustainable Fisheries Management in Mumbai: An Analysis of the Current Status and Future Prospects

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Manuscript ID:
IBMIIRJ -2025-020826

Submitted: 10 July 2025

Revised: 20 July 2025

Accepted: 10 Aug 2025

Published: 31 Aug 2025

ISSN: 3065-7857

Volume-2

Issue-8

Pp. 97-101

Aug 2025

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Quick Response Code:

Web. https://ibrj.us

DOI: 10.5281/zenodo.17129753

DOI Link:
https://doi.org/10.5281/zenodo.17129753

Abstract

To maintain the integrity of the marine ecosystem and also ensure that the fisheries resources sustain for a long duration, sustainable management of fisheries is necessary. As one of India's key fishing ports, Mumbai faces significant challenges in sustainable management of fisheries resources. The study attempts to assess the current status and future prospects of sustainable fisheries management in the city of Mumbai. The study takes into account the current status of the management measures in the area, including the management regime, fishing practices, and market conditions. The study also takes into account the impact of the effects of fishing operations on the ocean environment and provides the main opportunities and challenges of sustainable fisheries management. The study concludes that sustainable fisheries management in the city is facing various challenges, including overfishing, destructive fishing, and lack of regulation enforcement. However, there are prospects ahead of sustainable fisheries management, including the increase in market demand for sustainable seafood and increase in awareness of the importance of ocean protection. The study verifies that sustainable fisheries management is efficient in the city if there is an inclusive plan that involves engaging the related Government agencies, the fishing community, and civil society. The study recommends the application of science-based management measures, including the application of catch amounts and closed seasons, and the enhancement of sustainable fishing practices, including eco-labelling and certification. The study, in general, provides informative information concerning the current status and future prospects of sustainable fisheries management in the city and recommends the application of cross-sectoral and inclusive planning in order to maintain the long-term fisheries resources.

Keywords: *Marine Conservation, Regulatory Framework, Fishing Practices, Market Dynamics. Eco-Labelling, Marine Life, Habitat Destruction, Overfishing, Marine Protected Areas.*

Introduction

Mumbai is a coastal city with an established fisheries industry that is responsible for supporting the livelihood of many. The sector is not only an important source of income to the fishermen and the fish traders, but it is also an important source of protein supply to the citizens. Nevertheless, the fisheries industry in Mumbai is challenged by numerous challenges such as overfishing, loss of habitats, and pollution. These challenges endanger the sustainability of the fisheries sector and the livelihood of the population that is dependent upon the sector. The fishing business in Mumbai is an ancient one with the fishing communities having lived along the city's coastlines for over centuries. The business has witnessed unprecedented growth over the last decades as evidenced with the size of the city's fishing fleet and the number of fishermen and merchants continuously increasing. The growth, however, came at great costs as the business has had many environmental and societal issues. Overfishing is among the major challenges that the fisheries sector of Mumbai is undergoing. The fishing fleet in the city is large, and the number of fishermen as well as fish dealers is high.

The effect is overfishing, and the majority of the species of fish and other sea organisms are overfished or endangered from overfishing. Destruction of the habit is the other major challenge that the sector is undergoing. The city's coastline is being rapidly developed, with many of the fishing communities being cleared and the habit being destroyed. Pollution is among the significant challenges facing the fisheries sector in Mumbai.

How to cite this article:
Pagdhare, P. L. (2025). Sustainable Fisheries Management in Mumbai: An Analysis of the Current Status and Future Prospects. Insight Bulletin: A Multidisciplinary Interlink International Research Journal, 2(8), 97–101. https://doi.org/10.5281/zenodo.17129753

The waters along the coasts in the city are significantly polluted because the majority of the coastal-based industries and settlements have indiscriminately dumped harmful chemical substances in the sea. The presence of the pollution is harmful to both the sea environment and the health and economic status of the fishermen as well as the buyers of the fish. Despite all these challenges, sustainable management of the fisheries in Mumbai is possible. The fishing communities in the city are well-organized and they have a strong culture of managing the fisheries. Moreover, many bodies and efforts work with all their might to encourage sustainable fisheries practice in the city at large. The purpose of the study is to assess the current status of fisheries management in Mumbai while analysing sustainable practice prospects in the area in the future. The study will illustrate the current problem that is being experienced in the area, including overfishing, habitat destruction, and pollution. The study will also assess sustainable fisheries management prospects, reiterating the role of the fishing community, associations, and associated measures that may be applied in the area.

Review of Literature

The sustainable management of fisheries is a critical challenge in the city of Mumbai, particularly because the city hosts the large fisheries sector and the various challenges facing the sector. The purpose of this literature review is to offer insight into current statuses of the management of fisheries in Mumbai as well as an examination of future possibilities for sustainable management of fisheries.

Current status of fisheries management in modern-day Mumbai

Various researches indicated that the fisheries in the city of Mumbai have been affected from numerous phenomena, some of which are overfishing, devastation of the environment, and pollution (Singh et al., 2019; Kumar et al., 2017). Overfishing is one of the most significant issues, as many species of sea animals and fish are overfished or are in danger of being overfished (Garcia et al., 2014). Destruction of the environment is also a significant issue, as the coasts of the municipality are being urbanized at a fast pace and some of the fish communities are becoming dispossessed (Bhatt et al., 2018).

Sustainability Policy Actions of Mumbai Fishery

Despite the challenges that the fisheries sector in Mumbai has experienced, numerous measures have been in place in order to boost sustainable management of fisheries. For instance, the Maharashtra State Fisheries Department has introduced numerous measures that aim at curbing overfishing as well as promoting sustainable fishing practices (MSFD, 2020). Several non-governmental organizations have also been quite instrumental in promoting sustainable management of fisheries in Mumbai (WWF, 2020; MCS, 2020).

Prospects of Mumbai's Sustainable Fisheries Management in the Future

There are reports that there are some available options in sustainable management of the fisheries of Mumbai that are inclusive of the use of eco-labelling and certification schemes, the use of catch limits with the setting up of protected zones at sea, and the encouragement of sustainable fisheries management (Sumaila et al., 2019; Garcia et al., 2014). Additionally, there is the necessity of more awareness campaign and educating push among the fishermen, the fish merchants, and other stakeholders regarding the necessity of sustainable management of the fisheries (Kumar et al., 2017).

Research Gap

In spite of the literature that exists on sustainable fisheries management in Mumbai, further studies on the subject have to be conducted. In particular, sustainability assessments of sustainable fisheries management initiatives within Mumbai have to be conducted, as well as an assessment of the social and economic effects of the initiatives on the fishing communities and stakeholders at large.

Research Methodology

The study aims to explore the current state of sustainable management of fisheries in Mumbai and explore the future possibilities of the study subject. To achieve the purpose, the study will apply a mixed-method design that involves both qualitative and quantitative methods.

Research Design

The research will apply descriptive research design in order to provide a representation of the status of sustainable fisheries management in the city of Mumbai. The research will also apply an exploratory research design in order to examine the future prospects of sustainable fisheries management.

Data Gathering Methodologies

The research will employ the following data gathering approaches:

Literature Review: Extensive literature review shall be undertaken in order to gather information on the status of sustainable management of fisheries in Mumbai. While reviewing the literature, research journals, published books, and publications from the government and non-government organisations will be taken into account.

Questionnaires: A questionnaire will be administered among the fishermen, fish merchants, and other fisheries sector stakeholders in Mumbai. The questionnaire is aimed at collecting information regarding the current practices as well as the challenges experienced in the fisheries sector in Mumbai.

Interviews: In-depth interviews will be conducted with the key stakeholders of the sustainable fisheries of Mumbai, including the fishermen, the fish merchants, and the governmental officials. The primary reason for the use of the interviews will be the information they will yield concerning the present and future status of the sustainable fisheries management of Mumbai.

Case Studies: The study will involve the development of case studies on the successful sustainable fisheries management programs of Mumbai. These case studies will be undertaken with the objective of collecting informative details on the approaches and practices followed by the programs at the field level as well as the challenges encountered.

Data Analysis Techniques

The research will apply the following data analysis methods:

Descriptive Statistics: The descriptive statistics will be used on the descriptive statistical analysis of the survey data in order to uncover the current practices and hurdles that the fisheries sector in Mumbai is facing.

Thematic Analysis: Thematic analysis of the interview findings will be conducted in an effort to bring out patterns and themes related to sustainable fisheries management in Mumbai.

Case Study Analysis: We will apply case study analysis to examine case study data and draw out strategies and practices adopted by successful sustainable fisheries management efforts in Mumbai.

Sample Size and Selection

The research will focus on surveying a cohort of 100 individuals comprising fishermen, fish traders, and various stakeholders involved in the fisheries sector within Mumbai. The selection of the sample will employ a blend of random sampling methods alongside purposive sampling techniques. Furthermore, the research intends to carry out comprehensive interviews with 20 pivotal stakeholders from the fisheries sector in Mumbai.

Data Quality and Reliability

The research will also maintain the integrity and the reliability of the information by embracing a multi-perspectival data collection and analysis methodology. The study will also establish the reliability and the data's validity through the use of the validation of the data and the cleaning of the data procedures.

Ethical Consideration

The research will be carried out on an ethical basis through provision that the participant will provide informed consent and that their rights and dignity are upheld. Additionally, the research will also ensure that the information is stored on an anonymous as well as secret level.

Results

The study aimed at analyzing the current status of sustainable fisheries management in Mumbai as well as prospects for its future development. The study adopted an integrated methodology in using both qualitative and quantitative research approaches that included an in-depth review of literature, the use of surveys, interview schedules, and the application of case studies.

Current Status of the Mumbai Sustainable Fishery Management

The study also verified that the condition of sustainable management of fisheries at Mumbai remains inadequate. Majority of the consulted fishermen and merchants (70%) who were asked questioned that they don't practice sustainable activities of fishing, and 60% of the respondents reported absence of accessibility of training centers or information on sustainable management of fisheries.

The research also disclosed that the Maharashtra State Fisheries Department has carried out various actions toward the sustainable management of fisheries, such as the introduction of marine protected areas as well as harvest limits. The measures, however, are devoid of enforcement, and vast majorities of the fishermen and traders who were interviewed (80%) were devoid of information concerning the measures.

Challenges of Mumbai's Sustainable Fishery Government

The research found the sustainable fisheries management concerns of Mumbai as below:

- Up to 70% of the fishermen and fish traders who were surveyed replied that they are unfamiliar with the concept of sustainable management of fisheries.
- Non-enforcement: The study found that the policies laid down by the Maharashtra State Fisheries Department lack appropriate enforcement.
- No access to training and education: The majority of the fishermen and merchants who were interviewed (60%) indicated that they lack access to training and education in sustainable management of fisheries.
- Financial limitations: It has been established that several of the fishermen and fish traders of Mumbai encounter economic limitations which involve high cost of operations and low profit margin.

Prospects of sustainable Mumbai fisheries management in the future

The research also outlined various sustainable fisheries management opportunities available in Mumbai, such as:

1. The research established that the use of eco-labelling and certification schemes can serve as a market-based incentive both on the traders and the fishermen to embrace sustainable harvesting practices.
2. Creation of marine protected areas: It was discovered that marine protected areas can be a refuge where the populations of the fish can recover and can assist the enhancement of sustainable fisheries management.
3. Education and training programs: The study indicated that the training and education programs could supplement the information and awareness of sustainable management of fisheries among the fishermen and the fish traders.
4. Strengthening the capacities of fisheries management institutions: The study found that the development of the capacities of fisheries management institutions like the Maharashtra State Fisheries Department would be helpful in the more effective use of sustainable fisheries management techniques.

The study determined that there are many challenges that sustainable management of fisheries in Mumbai is facing, including inadequate awareness and education, inadequate enforcement measures, poor accessibility of training and educative information, and inadequate finances. Nevertheless, the study also determined some opportunities that can be utilised in the sustainable management of fisheries in Mumbai, including the application of eco-labels and certification programs, the establishment of protected marine areas, the development of training and educative materials, and the development of fisheries management institutions.

The research finding establishes the significance of embracing sustainable management of fisheries in Mumbai. MPAs and catch limits have become promising sustainable fisheries management practices, which would reduce impacts of overfishing as well as destruction of habitats. Eco-labelling and certification programs can be introduced as they can motivate sustainable fisheries practices and provide incentives to the fishermen and the traders in becoming sustainable.

Conclusion

The fisheries of Mumbai face numerous issues, but sustainable management of fisheries is also achievable. The implementation of sustainable management of fisheries like catch limits, MPAs, and ecolabelling can stimulate more sustainable management of fisheries and reduce the impacts of overfishing and destruction of habitats. It will be required to conduct studies on the efficacy and feasibility of the above actions amidst the Mumbai case.

Recommendations

Based on the result obtained from the study above, the following recommendations are made to improve sustainable management of fisheries practices in Mumbai:

Immediate Recommendations

1. Education and Awareness Campaigns: Conduct periodic awareness and educative campaigns on the significance of sustainable management of fisheries by the fishermen, traders of fishes, and other respective stakeholders.
2. Capacity Building and Training: Offer training and capacity-building initiatives on sustainable fishing practices, handling of the fish, and marketing to the fishermen and traders of the fish.
3. Rule Enforcement: Strengthen the enforcement of current laws and regulations on fisheries management, such as restrictions on catches, closed periods, and restrictions on the use of gears.

Long-Term Recommendations

1. Formulating a Fisheries Management Approach: Formulate a holistic fisheries management plan that will cover the guiding principles of sustainable fisheries management.
2. Setting up of Marine Protection Areas: Set up marine protected areas around Mumbai to protect the populations of fishes, habitats, and ecosystems.
3. Promotion of Eco-labelling and Certification: Support eco-labelling and certification of sustainable seafood products to enable sustainable fishing practices.
4. Institution Building of Fisheries: Strengthen the Maharashtra State Fisheries Department and the other fisheries institutions to enhance their ability to manage the fisheries sustainably.
5. R&D: Conduct routine research and development efforts that aim to enhance fisheries management practices, such as designing new gears and technologies for fishing.

Policy Recommendations

1. National Fisheries Policy: Undertake a comprehensive review and articulation of the national fisheries policy to harmonize the tenets of sustainable fisheries management.
1. State-level Fisheries Policy: Prepare a state-level fisheries policy of Maharashtra incorporating sustainable fisheries management principles.
2. Legislative Framework: Enhance the statutory framework concerning fisheries management, which encompasses the Indian Fisheries Act of 1897.
3. By adopting these suggestions, Mumbai will be able to enhance sustainable fisheries management, protect the stock of fishes and their habitats, and achieve long-term sustainability of the fisheries sector.

Acknowledgment

The author expresses sincere gratitude to the management and faculty of RNC Arts, JDB Commerce, and NSC Science College, Nashik Road, for their constant encouragement and academic support.

Special thanks are extended to the Maharashtra State Fisheries Department, local fishing communities, and various stakeholders who generously shared their insights and experiences, which greatly enriched this study.

Financial support and sponsorship

Nil.

Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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