

Title

"A STUDY OF PHYSIOGRAPHICAL AND SOCIO-ECONOMIC ASPECTS OF WOREI KOLIWADA"

By

Ms. RITI KUSHWAHA

A DISSERTATION

Submitted To

Department of PG Geography,

Nagindas Khandiwala College of Commerce, Arts and Management Studies,
Mumbai- 400064

In partial fulfilment of the requirements for the degree of

Master of Arts- Geography

Academic Year - 2021-22

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MALAD KANDIVALI EDUCATION SOCIETY'S

**NAGINDAS KHANDWALA COLLEGE OF COMMERCE, ARTS &
MANAGEMENT STUDIES and
SHANTABEN NAGINDAS KHANDWALA COLLEGE OF SCIENCE
AUTONOMOUS**

DEPARTMENT OF PG GEOGRAPHY

Certificate

This is to certify that Ms. Kushwaha Riti Anand has successfully completed the Dissertation as a part of the MA-II- Semester IV syllabus titled "A study of **physiographical and socio-economic aspects of Worli Koliwada**" under the guidance of Dr. Chandani Bhattacharjee during the Academic Year 2021-22.

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Date: *25th April, 2022*

DECLARATION

I wish to state that the work embodied in this dissertation titled "A study of physiographical and socio-economic aspects of Worli Koliwada" is my own contribution. The dissertation is carried out under the guidance of Dr. Chandani Bhattacharjee in the academic year 2021-2022.

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SIGNATURE OF THE CANDIDATE

PLACE: MUMBAI

DATE: *25th April, 2022*

Acknowledgement

I would like to express my deep sense of gratitude to the principal of our college, Prof. Dr. Moushumi Datta for allowing me to conduct my survey smoothly.

My gratitude and thanks to the supportive guide Dr. Chandani Bhattacharjee and other faculty members of Department Of Geography.

I am also obliged to my fellow friends for their generous help on many occasions.

I wish to extend my gratitude to the respondents of the study area for the unconditional help and support during my field study.

Last but not the least I would not have completed my report without the support of my family members.

Riti Kushwaha

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CHAPTER 1

INTRODUCTION

1.1 Introduction to the study

Mumbai being a coastal city supports fishing and related activities since ages. Mumbai has a long coastline of around 720 kilometres; hence fishing is prevalent all along the coastline. Fishing is done in order to meet the needs of the domestic as well as the foreign demands. Fishes are important constituent of diets for billions of people all across the World. Rohu, Catla and Mrigal are highly demanded by people nation-wide. Pomfret fish is highly popular in Mumbai. Mumbaikars love this variety of fish so it has huge demand in markets. Many fish dishes are prepared in Mumbai constituting the staple meal of millions of people in Mumbai on everyday basis. Hence, fishing is a major economic activity in the coastal city, Mumbai and is mainly done by the Koli community.



Figure 1.1 Koli women selling fishes

The Koli community is the oldest and most primitive fishing community of Mumbai. For over 500 years, this community has been engaged in this primary activity. The Koli community has a very rich history as they are the aboriginal fishing community of the region. They constitute ethnically unique group having unique dressing style, food habits, accent and culture.

The places where the Koli community lives is called a 'Koliwada'. They are many Koliwadass in Mumbai – Worli Koliwada, Sion Koliwada, Vasai Koliwada, Colaba Koliwada etc. Thousands of Koli families live in these Koliwadass and catch fishes on daily basis but this activity is not easy. They have to face several problems while fishing.

The amount of pollution in the Arabian Sea is increasing day by day. Different types of sewage wastes, effluents etc are dumped into the Arabian Sea. Lots of solid waste is also discarded in the Arabian sea, leading to more polluted water. This causes immense trouble to fishermen while fishing. They are forced to go deeper into the sea to catch fishes. Many other problems are also faced by them.

Secondly, they also face hardships due to infiltration of migrants in Koliwad, this affects their physical and cultural space.

1.2 LITERATURE REVIEW

(Senapati, 2016) In his study, a survey was conducted in five fishing villages in Mumbai. Around 200 fishermen were surveyed to collect data. The aim of the research was to find out the socio – economic implications of climate change and how the fishing community i.e., Koli is vulnerable to it. In the study, it was found that fishing communities from Madh and Worli villages seemed to be more vulnerable and they were less adaptive as they lacked resources. They were unable to use modern and advanced mechanised boats. They also lacked machines with new technology, such as GPS (Global Positioning System) etc. They also were badly affected by the impact of climate change. Climate change also affects the socio-economic conditions of fishing communities. (Ganesh, 2021) conducted a study on Worli Koliwada, in her study, it was found that the Kolis maintain cultural balance of the place. They are highly engaged in fishing. They are showing changes in their lifestyle, now they have started to send their children to school. Thus, the literacy rate is increasing among them. They want their children to educate themselves and be independent in the future. It was also found that Worli Koliwada is densely populated as the rents and cost of houses in Mumbai are extremely high so migrants prefer to reside in fishing villages, adding more people to the Worli Koliwada. Secondly as more and more people come to Mumbai to settle over here, the demand for fish is continuously increasing leading to higher involvement of firms in fishing activity. Thus, now they have modern machines which are technologically advanced but they are still unable to use them properly. (Honey, 2018) conducted a study on Worli Koliwada to study about the role of the architect in these fishing communities. This study was required as Worli Koliwada is a densely packed fishing village. In the study, it was found that a floating device is not an architectural design, but these designs were not needed to have a good effect. (Bose and Parikh, 2017) conducted a study to focus on the community and culture of Koli People, in this study, different celebrations of the Koli Community in Worli Koliwada were studied. The importance and role of Koli women in catching fishes and doing related activities was also

analysed. It was found in the study that Worli Koliwada faces serious problem of solid waste management. (Antony, 2021) in his article, it was found that there is lack of space for boats in shallow water, it was due to the reclamation activity. Kolis are facing several issues due to increasing pollution in the Arabian Sea. They are facing hardships because of the construction of the coastal road project along the coast of Mumbai. (Arora – Desai,2013) in their article wrote about the impact of Bandra Versova Sea Link on the fishing activities. The fisherman expressed their vulnerability in this article because of BVSL. Many fishing families around Juhu would be severely impacted because of this project. This project of Sea link has led to depletion in the fish resources and also the erosional rate has increased a lot because of this. It also led to increased pollution, affecting the ecosystem, which would ultimately affect the existing biodiversity and the marine ecosystem. There would be degradation in the marine environment which would have deep consequence of the livelihood of Koli community. (Mahimkar,2015) in her study discussed about the conflict between the migrants and the indigenous population in Mumbai. In Mumbai, Koli community is the primitive inhabitant of Mumbai, along with them people from all across the country migrate to Mumbai. So, sometimes there is conflict between them as the city has accommodate all of them. The conclusion of the study is that the government should frame different policies in order to solve the issues of both the groups who prefer to live in the same site in Mumbai. (Krishna, 2016) in her article studied about Koliwada in Worli. In the article, it is said that Koli people are the original fishermen of Mumbai from the time when it was not even today's Mumbai, it was a group of seven islands apart from each other. With the advent of technology and increased urbanisation, the land of Mumbai was reclaimed and we got today's Mumbai still the Koli community follow their traditional means of livelihood. They have maintained their original characteristics even despite of rapid urbanisation and modernisation. (Bushby, 2020) in her applied research aimed to understand the physical and mental health of Koli women in Worli Koliwada and also to suggest adequate measure that would improve their lives, bringing gender equality. They encouraged women, supported them to be independent. (Jale, 2014) in his study on different Koli communities across Mumbai found out that several changes are occurring in the socio-economic lives of Koli people but these changes are negative. There is significant difference in their living conditions a few decades ago and now. There are also some positive changes in their livelihoods but the Koli community is facing serious problems due to rapid changes in Mumbai because of urbanisation and also their social status is low also in the city. (Kasturi, 2019) in his study on child health and related healthcare practices in a fishing village in West Bengal found out that there were different individuals belonging to different religions

and income groups. Most of the respondents said that their wives took care of the children, in case cases the kids were looked after by family members and even neighbours. They did not have access to clean water, they were dependent on pond and river water for various purposes and this led to high prevalence of diarrhoea in children. Children also suffered from various other disorders like cough and cold, abdominal pain, skin diseases etc. The reason was the unhygienic practices and lack of sanitation. (Debasish, 2019) conducted a study on sustainable fishing practices and fishing communities. This study was conducted in Barak Valley (Assam). In his sociological study, it was concluded that fishing communities are exploiting the natural environment in order to obtain more and more resources from the environment. The environment is getting changed by natural and human interferences and man is also adapting to the changing environment. The production of fishes in natural fisheries is decreasing whereas the production of fishes in capture pond fisheries show increase. (Appathurai, 2015) conducted research to understand the impact of mechanisation on fishing industry. The study area was Kanyakumari. In this study, it was revealed that the process of mechanisation in fishing industry showed phenomenal growth from 1981 to 2011. Shifting from traditional fishing to mechanised fishing has caused positive impact on the income of fishermen; they are now able to earn higher wages. The knowledge about sea, ability to use new machines and technology has also improved with the use of mechanised fishing. Mechanisation of fishing has positively impacted many dimensions of fishing however there are some ill effects too which require efficient policy formulation to be solved. There is growth in fishing industry but it is too slow. (Das & Provash, 2016) conducted a study on traditional fishing community of the Dhubri District in Assam. This study was conducted on Namasudras Fisherman, apart from fishing they also practiced carpentry, agriculture and related primary activity. The socio-economic condition of this community is extremely bad and is becoming worse with every passing day. They very little or almost no land, they are entirely dependent on fishing but they are unable to earn sufficient wages by selling fishes, hence they are economically backward. Poverty and illiteracy prevail throughout the community. (Sreedevi, 2012) in her study, it was found that a portion of income which is earned by the fishing community is spent on alcohol. There is prevalence of disguised unemployment in fishing communities. These communities are not taken into consideration during policy formulation by Government. They are overlooked in all the decision-making processes. Although, they play important role in contributing to nation's income still do not get proper facilities and support for their development and growth. (Singh, 2004) conducted his study regarding child abuse in fishing community in North Chennai. It was found that the environment around the children is

unfavourable, the major reason behind this may be abusive childhood of the neighbouring population. Most of the fishing community in Chennai live in Kuppam which is slum area and they are extremely poor. The children in these slums are abused sexually, emotionally, physically and mentally. The bad habits of parents influence their children severely and male children are exploited more than female children. (Parshuram, 2013) conducted a study on marine fisheries in Sindhudurg in Maharashtra (2001 to 2010). It was concluded that the fish market was controlled by only a few merchants and they only earned profit. The fish markets are unhygienic and lacked various facilities like cold storage etc. Most of the fisherman are addicted to liquor. Some even consume pan and cigarette. Hence, they are lacking behind economically. (Pabitra, 2017) conducted research on fishes and fisheries of Subansiri River in Assam. She analysed that Subansiri river has good variety of fishes around 181 species. The water temperature of the Subansiri River is optimum for the growth of fishes and other aquatic life. Around 23 types of zooplanktons were also identified in this study. However, increasing pollution has caused depletion in the fish resources in the river and also the establishment of hydroelectric project in the nearby area has adversely impacted the fish production. (Chakraborty,2017) conducted her study to know about the position of women in fishing communities in West Bengal. She concluded that most of teenage girls are engaged in this activity, they do not have access to good food, proper clothes and their work place even lacks basic sanitation facilities. They are employed at excessively low wages. They are marginalised and unsupported. They suffer from various health disorders as they don't even have access to clean drinking water. They don't even get the benefits of welfare schemes implemented by the government bodies. (NB,2019) conducted study on impact of technological changes on Fishing sector. The study area was Kerala. The majority was respondents were Hindus and the females engaged in this business were around 22%. It was seen that less than half of the fisherman adopted newer technologies, others were still using the traditional methods of fishing. A majority of fisherman using newer technologies are satisfied with it and earn better income while those who still use primitive technology believe the old technology to be the most efficient.

1.3 RESEARCH OBJECTIVES

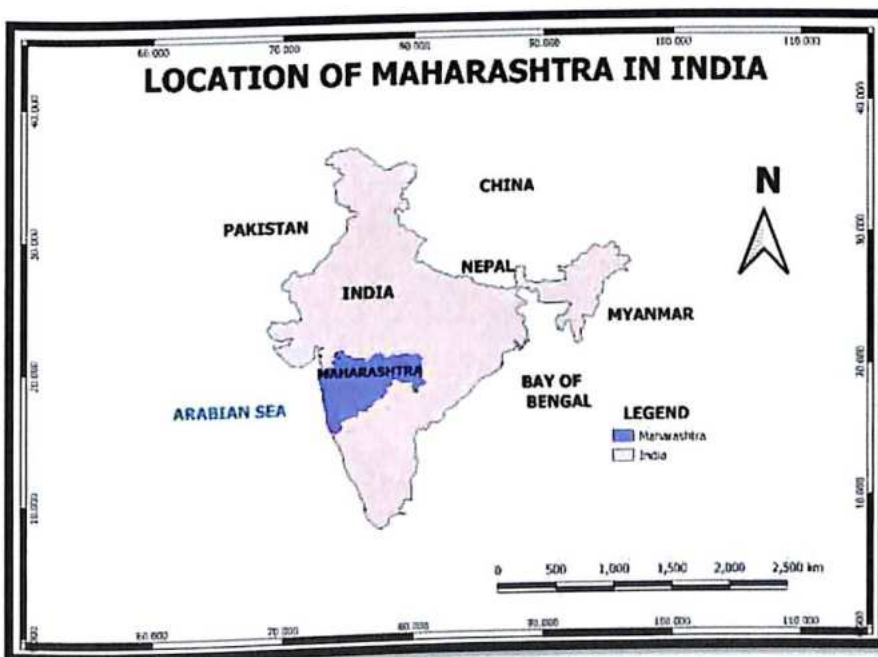
As every study has certain objectives, this study also has the following objectives.

1. To know about the lifestyle and fishing problems of the Koli community in Worli Koliwada.
2. To understand the physiographical and socio-economic aspects of the Koli community in Worli Koliwada.

3. To suggest measures to improve the socio – economic life of fishing community in Worli Koliwada.

4. To understand the cultural amalgamation in the Koliwada from the migrants.

1.4 AREA OF STUDY



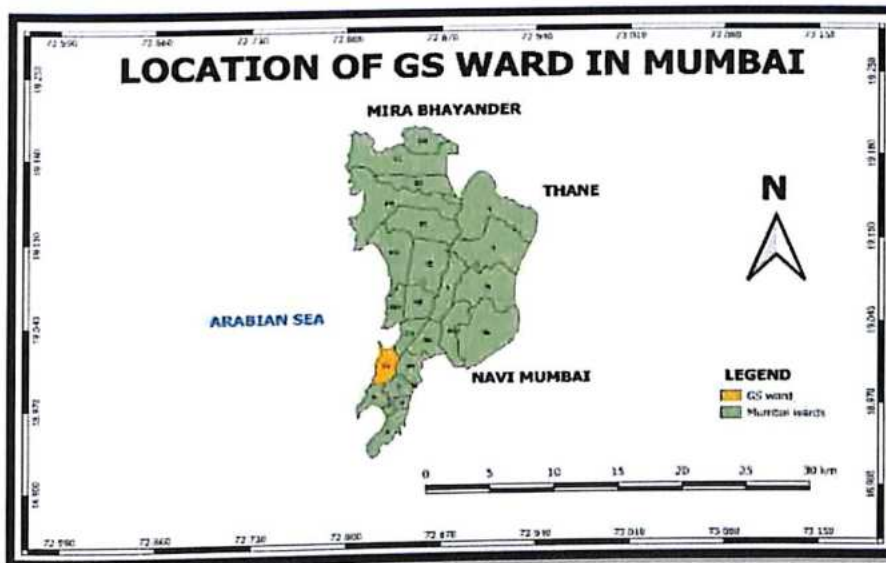
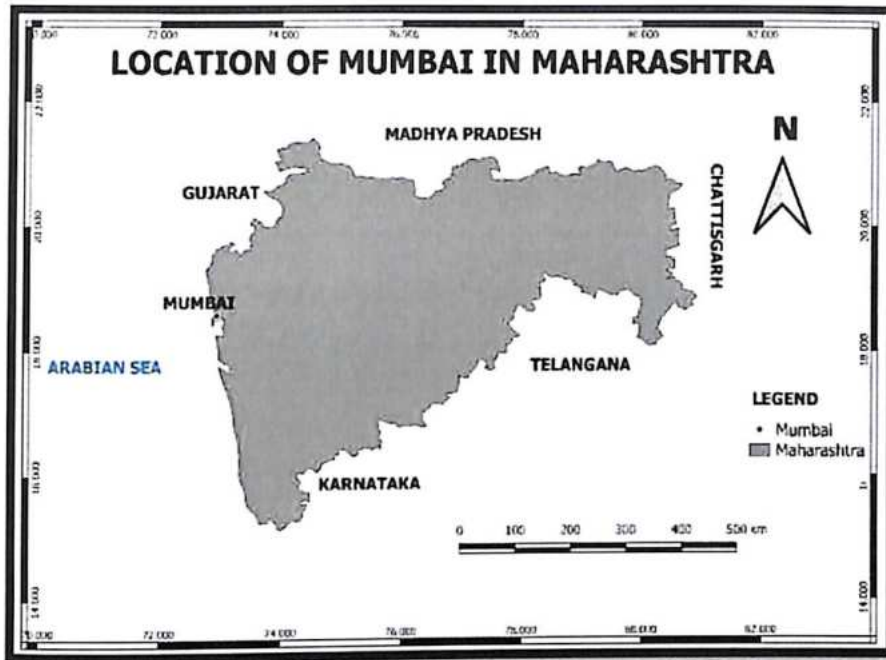


Figure 1.2 Location map of the study area

1.4 A) LOCATION BACKGROUND

Mumbai is situated on the peninsular site. Earlier it was a group of Seven Islands located on the Konkan Coast of the Western India. The latitude and longitude of Mumbai is 19.0760° N and 72.8777° E respectively.

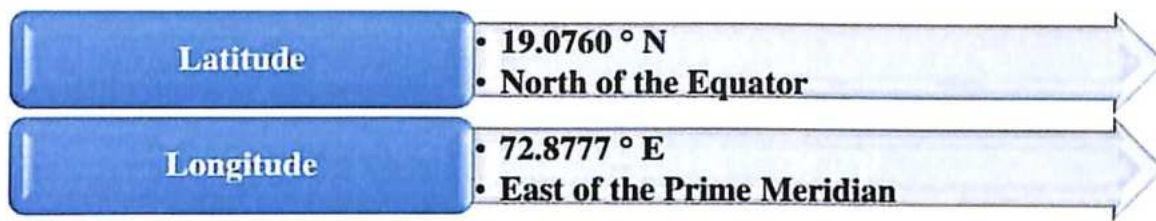


Figure 1.3 Geographic coordinates of Mumbai

On the western side of Mumbai lies Arabian Sea, Navi Mumbai on the eastern side, Mira Bhyandar on the northern side, Thane district lies on the north eastern side and Thane district lies in the south eastern side and Colaba lies on the Southern side of Mumbai.



Figure 1.4 Adjoining areas of Mumbai

The altitude of Mumbai is 10 metres to 15 metres. The area of Mumbai is approximately around 603 square kilometres.

Mumbai is a metropolitan as well as cosmopolitan city. It is the capital city of the Western state of Maharashtra and it is also the financial capital of India. It is one of the most densely populated cities of the world. The northern region of Mumbai is getting much more populated as compared to the Southern region.

1.4 B) HISTORICAL BACKGROUND

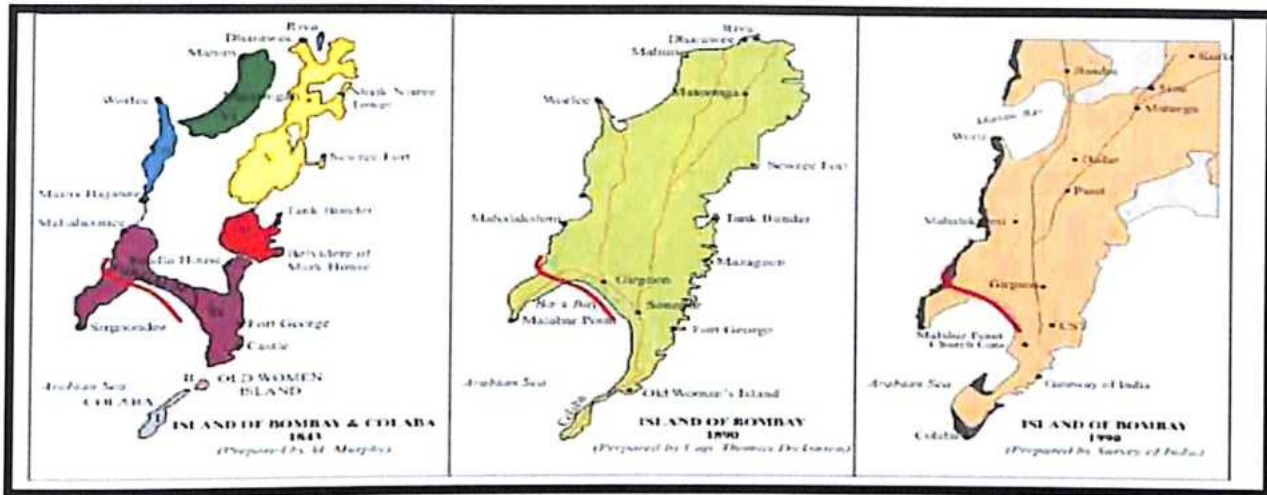


Figure 1.5 Evolution of Mumbai over the years

Source: <https://www.researchgate.net/>

Originally Mumbai was a group of seven islands. These islands were Mahim, Worli, Parel, Mazgaon, Palva Bunder, Colaba and Chhota Colaba. These small and isolated islands were inhabited by the Marathi speaking Koli people who were engaged in fishing activities.

The development Of Mumbai began in the 18th Century under the British influence. Britishers realized the importance of development of Mumbai as Mumbai acted as a port city used for exporting finished goods and various other useful commodities from different parts of India to their homeland in Great Britain. Hence, Mumbai had become an important port so British decided to develop Bombay, with the advent of Industrial development of Mumbai, Mumbai started attracting increased number of people from all corners of the country.

Moreover, more land was required for setting up new industries, but the land was confined to these Seven Islands. So, in order to expand the areal extent of Mumbai, Britishers decided to merge all these Seven islands into a single landmass and hence the Reclamation Project was started. After the completion of land reclamation project, the seven islands of Bombay were finally merged into a single landmass, which is today's Mumbai.

The present city of Mumbai is mainly located on the reclaimed land. The reclamation of Seven Islands was very important in shaping the present structure of Mumbai. However, today also Mumbai is facing severe problem of lack of space and increased traffic due to its dense population.

Mumbai is city of dreams; it provides employment and chances of better opportunities to all its residents. It is a famous tourist destination in India. People from all across the country visit Mumbai for several reasons ranging from employment to leisure. The Bollywood of Mumbai is also quite famous not only in India but also all across the Globe. Fans from all corners of the world visit Mumbai to meet their favourite celebrities. However, the history of the City of Dreams begins from a small temple.

The city of Mumbai derived its name from the Goddess, Mumba Devi. Mumba Devi temple is located in Bhuleshwar in Mumbai. Mumbai Devi is the Goddess worshipped originally by the Koli community. Presently, the temple is visited by large number of devotees from all across the country. Devotees have deep faith in Mumba Devi.

Britishers took different measures to develop the city. Even after India's independence in 1947, the development of Mumbai continued rapidly. Being port city, it has always been an important location from economic point of view. Large number of industries and other projects started over here, leading to migration of people from all across the country. This resulted in overcrowding, pollution, disturbance to the marine and mangrove ecosystem, interference in the traditional life of the Koli people.

1.4 C) DEMOGRAPHIC ASPECT

Mumbai is the most populated city in India. It is the 4th most populated city globally and one of the most populated urban regions in the world.

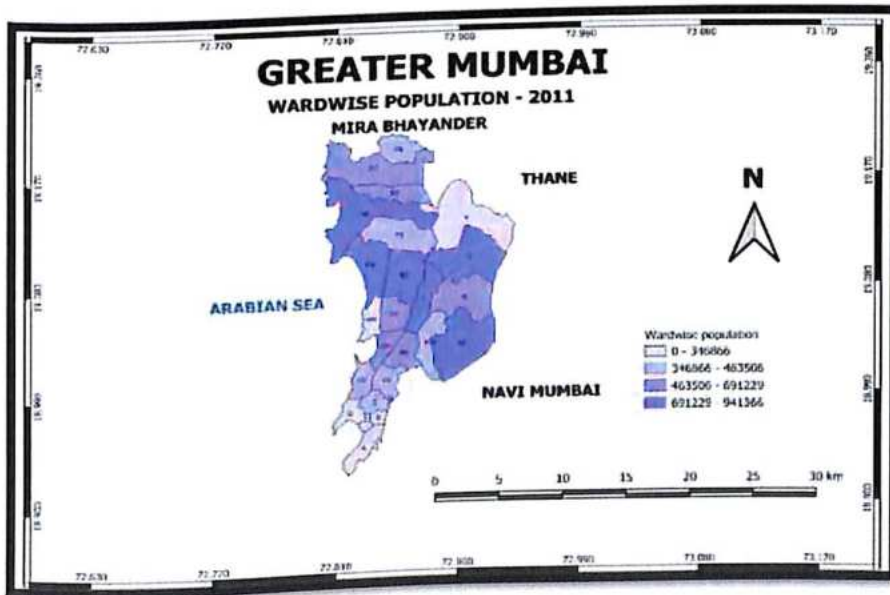


Figure 1.6 Population map of wards of Greater Mumbai

Table 1.1.1 Temporal analysis of Mumbai's Population from 1971 to 2011

Year	Population
1971	59,70,575
1981	82.43,405
1991	99,25,891
2001	1,19,78,450
2011	1,83,94,912

Source: <https://worldpopulationreview.com/world-cities/mumbai-population>

Presently, Mumbai's population is estimated to be more than 22 million. In India, Mumbai is the city having highest number of trade opportunities, business activities and other financial aspects. Therefore, the city has witnessed huge increase in its population over the past 20 years. This phenomenon is common for all the metropolitan areas of the country. People from economically backward states like Uttar Pradesh, Bihar, Madhya Pradesh etc. come to Mumbai to earn money and support their families in the rural areas. This adds to the population of Mumbai. The population density of Mumbai is approximately around 73,000 per square mile.

However, due to continuous increase in the population of Mumbai, the cost of houses, flats, apartments, etc are also rising at an alarming rate. Mumbai's demographics relate to us that the city of dreams is like a melting pot where all kinds of people assemble together for the livelihood. It has people from all parts of the country, making it cosmopolitan in nature. Almost all the major languages of the country are spoken over here. Gujrati, Marathi, Hindi are among the most popular languages in Mumbai. Mumbaikars have unique *Bambaiya* accent.

Table 1.1.2 Classification of Mumbai's Population according to the religions

Religions	Percentage (%)
Hinduism	65.99
Islam	20.65
Christianity	3.27
Jainism	4.1
Buddhism	0.49
Sikhism	0.49

Source: <https://www.census2011.co.in/>

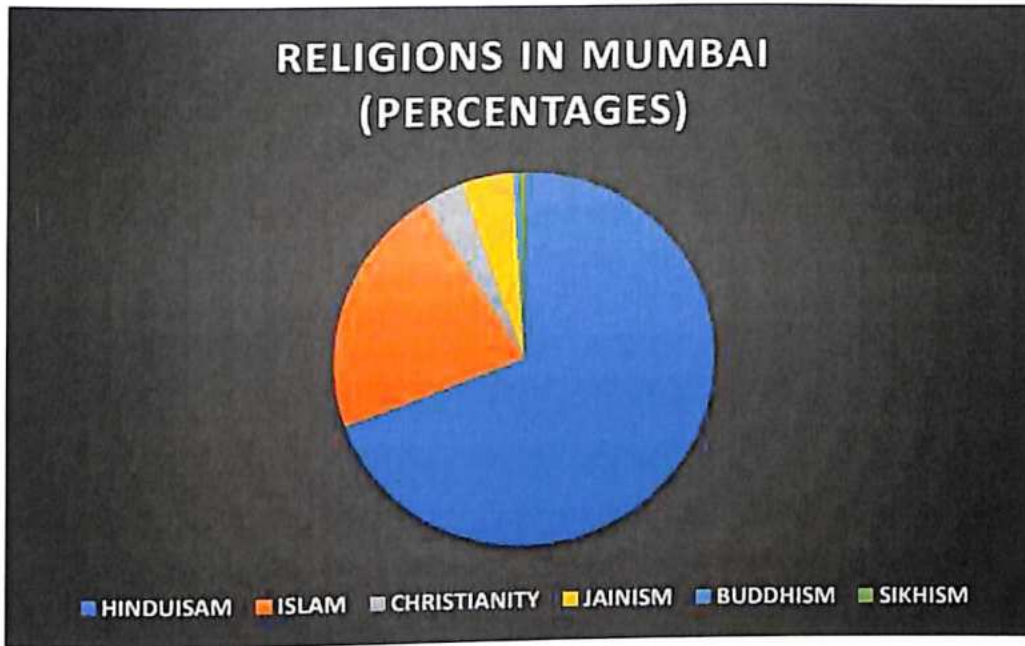


Figure 1.7 Classification of Mumbai’s Population according to the religions

Table 1.1.3 Classification of Mumbai’s Population according to the caste

Percentage (%)	Caste
42	Maharashtrians
19	Gujaratis
39	People from rest of the country

Source: <https://worldpopulationreview.com/world-cities/mumbai-population>

Due to expensive housing in Mumbai, majority of people are forced to live in the outskirts of the city and they commute on a daily basis to earn their wages in Mumbai. Due to this, people are left with only alternative to live in slums.

Roughly around 41.3 percent of Mumbaikars live in slums. Approximately around 9 million people live in these areas. Mumbai has the second largest slum of Asia i.e., Dharavi Slum. Dharavi has an area of 535 acres. It is highly congested in nature.

The Malad Dahisar region in the west has also witnessed tremendous growth over the last few years.

1.4 D) GEOGRAPHICAL BACKGROUND

Climate of Mumbai

Mumbai being a coastal city experiences maritime climate throughout the year. It means that neither the temperature is too high in Mumbai nor it is too low. The temperature is more or less same throughout the year.

Mumbai experiences hot and humid climate. The three main seasons in the city are – summer season, rainy season and winter season. The rainy season starts in the month of June with the onset of South West monsoon from the Arabian Sea. These moisture laden South West winds bring heavy showers in Mumbai.

As Mumbai is located on the windward side of the Western Ghats, thus receives heavy rainfall. Heaviest showers are witnessed in the months of July and August. Sometimes, it rains continuously for several days affecting human life severely. The roads get blocked and local trains have to be paused in order to avoid accidents.

Mumbai experiences winter season from the month of November to January. However, winter in Mumbai is not at all chilly. The temperature are more or less always above 15 degrees. Cold breezes are felt during early morning and late nights. January is the coldest, month of the season.

The summer season starts by the end of February and lasts up to the end of May. The days are quite hot and sunny. However, Mumbai always has moderate temperature due to influence of land and sea breezes.

1.5 RESEARCH METHODOLOGY

The study has been conducted in the following manner. The research methodology is divided into three phases in order to systematically study all the aspects which are vital for the study. The work has been divided into three parts to avoid confusion and also for better understanding of the findings. So, the three phases of the study are- Pre field, on field and post field.



Figure 1.8 Phases of research methodology

A. Pre field

In order to know about the lifestyle and the fishing problems of the Koli community in Worli Koliwada, firstly the review of literature was done so that research gap could be identified and that would be studied in this study. So, various relevant data related to the study topic was collected from a number of sources. A good number of newspaper articles, journals, e-books and other online and physical sources were referred. Books from college library were also

referred. Online maps and satellite imageries have been referred to know more about the study area and its neighbouring places.

Secondly, as this study is based on primary data, so a well-structured questionnaire was prepared using Google forms for primary data collection from the study area i.e., Worli Koliwada. The questionnaire was prepared keeping in mind all the objectives of the study so that proper conclusions can be drawn out after the analysis of the findings. Then, the sample size was decided to carry on the study smoothly in a scientific and systematic way. The sample size for this study is 100.



Figure 1.9 Pre field steps

B. On field

Survey was done in the study area i.e., Worli Koliwada. Random sampling method was used. The residents of Worli Koliwada were asked surveyed according to the questionnaire. Naturalistic observation was also carried on for better understanding of the various socio – economic and the physiographic aspects. When required more questions were asked according to the flow of the interactions so that the respondents become comfortable and answer freely. However, only the relevant answers were recorded which were necessary for the study. After the survey, the physiographical aspects of the study area were also studied. The survey was conducted in the month of February, 2022.



Figure 1.10 On field steps

C. Post field

The results obtained after conducting the survey was segregated, stored and analysed. The results were presented in forms of graphs and tables for better understanding of each question’s answers by the respondents. The data was analysed and tabulated in MS Excel and documented in MS Word. Q GIS software was used to create maps for better representation of the findings. Accordingly, the limitations and the major findings were identified. After understanding their lifestyle, fishing problems, socio-economic aspects and the cultural amalgamation, suitable

suggestions and measures were discussed to improve their lives and have a better experience of fishing.

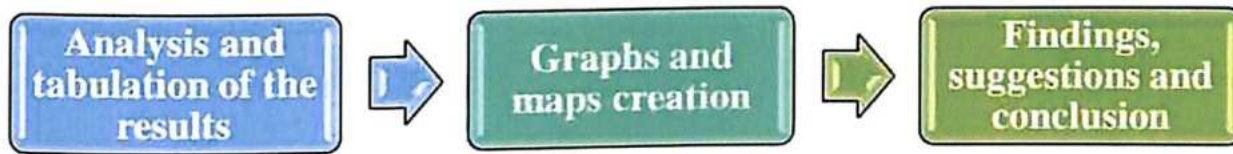


Figure 1.11 Post field steps

1.6 LIMITATIONS OF THE STUDY

Every study has some limitations. Similarly, this study also has a few limitations, which are as follows:

1. While conducting to survey, it was really a challenging task to reach out to a so many people in the Worli Koliwada.
2. The respondents seemed to respond dishonestly, may be because of hesitation or some other reason.
3. Language was the major barrier while conducting the survey. Majority were unable to understand Hindi or English, so it was an extremely difficult task to know their responses. Still, efforts were taken to make them fully understand the questions and the purpose of the survey.
4. Majority of respondents didn't allow us to enter their houses as they doubted our intentions and were suspicious about us as we were strangers to them.
5. Only a small section of respondents was cooperative and answered freely without any hesitation or dishonesty.
6. Many people did not answer to some of the questions relating to income etc. because of security reasons.
7. Some people also felt that survey isn't fruitful at all, it's just wastage of time and energy so they refused to interact and be a part of the survey.
8. Some residents of the study area felt that their personal information may be misused so they refrained from sharing it.
9. Many fishermen were busy in their household chores, some were busy in selling fishes so due to time constraint they didn't participate in the survey.
10. Some of the illiterate respondents who were very old did not know their exact age.
11. Collecting primary data in Worli Koliwada was a time-consuming task.
12. The study area was full of foul smell of fishes; hence it became extremely unpleasant to conduct survey in such a place.

1.7 STATEMENT OF THE RESEARCH

Fishing is one of the most important activities in practiced in Mumbai. This activity is mainly done by the native fishing community of Mumbai i.e., the Koli fishing community. The study attempts to study about this oldest fishing community which has managed to practice its traditional occupations since ages, generations after generations. This community resides all across the Mumbai city but this study aims to focus only on the Koli community in Worli Koliwada and understand their problems in dept. Koli people have continued to maintain their authentic fishing techniques since ages. They have passing on these skills from one generation to the other, this has preserved their culture over the years. However, with the changing times, certain changes are also seen in their culture.



Figure 1.12 Traditional housing patterns of Koli community

Mumbai is growing rapidly in all aspects, thus attracting a greater number of migrants from all parts of the country. Due to intensely high housing prices in the city, migrants have to choose to reside in Koliwadadas. As Koliwadadas offer not only cheap housing but also safe living spaces but this creates several hardships for the indigenous people of the Koliwada. Koli people are affected by the migrants in several ways, the continuous influx of the migrants in the Koliwada has not only caused lack of space in the Koliwada but also interfered with the traditions and culture of the native people. The language, food habits, clothing styles, celebration habits, way of celebrating festivals are getting changed with continuous exposure to new way of living.



Figure 1.13 Typical houses of the Worli Koliwada

Thus, the original and primitive essence of the Koli culture is somewhat getting lost in today's era. Several problems are being faced by the Koli community and other people living in the Koliwada since ages.

The problems include socio- economic, health, fishing and migrants related problems.

1.8 SIGNIFICANCE OF THE STUDY

Mumbai is a coastal city, located on the mouth of Ulhas River on the Western Coast of India in the State of Maharashtra. Mumbai enjoys long coastline. The length of Mumbai's coastline is approximately around 720 kilometres. The coastline is indented in nature. It forms major part of the Konkan Coast. Mumbai has a number of beaches and islands.



Figure 1.14 Coastal Project affecting the fishing region

The coastline of Mumbai is rocky at places. It supports fishing activities at a large scale. The long indented coastline of Mumbai has always been beneficial for the fishing communities in the region, thus earliest known economic activity of Mumbai is fishing, primitively done by the Koli community.

However due to increasing marine pollution in the Arabian Sea at an alarming rate, the problem of the Koli community is also increasing day by day, they encounter variety of obstacles while earning their means of livelihood. This affects their health also. On the other hand, several coastal projects are made and are already being planned by Mumbai Metropolitan Region Development Authority (MMRDA). This causes infinite obstacles to fishermen as the fishing

areas get reduced. The Worli Koliwada is just opposite to the Bandra Worli Sea Link so the Koli community in the Worli Koliwada face barriers in fishing because of it.

Apart from Bandra Worli Sea Link, many other coastal projects are proposed to be constructed in near future. This has increased stress among the fishing community. Mumbai Trans Harbour Link, Coastal Road etc. are some of the examples of such projects.

Secondly, due to increased migration of outsiders in the Koliwada, the social and cultural space of Kolis is also affected. Mumbai being a metropolitan city has infinite numbers of opportunities to enhance one's career and standard of living. Consequently, more and more people from smaller towns and villages migrate to Mumbai to improve their economic conditions but the city has expensive apartments and flats. The rents are also too high to be paid by these migrated people, hence they prefer to accommodate themselves in these Koliwadass as they are comparatively cheaper and affordable by a few migrants. So, this creates conflict among the original fishing community and the outsiders as the space is limited but the residents are increasing. Moreover, they have significantly different culture, traditions and lifestyle which leads to cultural amalgamation in the Koliwada.

This study would help to know about the socio-economic and physiographical aspects of the Worli Koliwada. Moreover, this study is significantly important to study about the problems and impact of cultural amalgamation on the indigenous Koli community.

The study would pave way to suitable suggestions, recommendations and measures to help the Koli people to maintain their rich culture without getting troubled with changing times.

It would also help them to improve their day-to-day experiences.

1.9 CONCLUSION

This chapter includes basic introduction about the Worli Koliwada and also about the Mumbai city and the manner in which study would be conducted. It also discusses the objectives and the research methodology of the study. It explains about the ancient and rich culture of the Koli community, how they have been the most indigenous fishing community of Mumbai but with changing time, their culture is also witnessing changes due to the infiltration of the migrants from different parts of the country. This chapter throws light on the problems caused to the Koli people due to the costal projects being constructed in Mumbai and the adjoining areas, which is eventually affecting their lifestyle and the socio- economic status.

CHAPTER 2

STUDY OF FISHING VILLAGE IN WORLI KOLIWADA

2.1 INTRODUCTION

A study of the fishing villages and their socio-economic development is incomplete without the study of the life, the culture and habitation style of the community. This chapter provides detailed information about fishing villages and their characteristics. The distribution of fishing villages globally and also in India with examples. The fishing profile of India is also elaborated. State-wise fish production and finally the chapter discusses the locational and the historical background of the Worli Koliwada in detail.

2.2 MEANING OF FISHING VILLAGE

A fishing village is hamlet which is usually located near a fishery. The people in fishing village are mainly engaged in fishing activities i.e., they catch fish for household consumption as well as for earning their livelihood. They harvest sea food.

Since the final division of Stone Age i.e., Neolithic period, the coastlines are the habitats of the fishing communities, they are ideal for development of fishing villages. These fishing hamlets not only develop on the coastlines but also develop on the banks of rivers, shorelines of lakes and ponds. Most of the fishing villages seen all around the world are traditional. These communities have maintained their traditions since ages. They pass their fishing techniques from one generation to the other.

2.3 CHARACTERISTICS OF FISHING VILLAGES

Fishing villages are unique in their own ways. They have certain characteristics they make them different from other settlements around them. The main characteristics of the fishing villages are:

1. Most of the fishing villages are mostly isolated from the surrounding areas. They are situated around a small natural harbour which renders safe location for the development of the hamlet.
2. The fishing village requires safe place for keeping their boats and other equipment when they are not in use.
3. Fishing villages may be located on beaches, river banks or lake shorelines.
4. Village fishing boats are mostly placed alongside the beaches at a specific location.
- 5 The types of boats used by the fishing village depend on their traditional approach and also on their technological advancement.

- 6 Some villages move out onto the water itself; these are known as floating villages. Example of such floating village is Ha Long Bay in Vietnam, the Kelong located in waters off Malaysia, the Philipines and Indonesia.
- 7 Some fishing villages are also located on floating islands. In India, Phumdi (fishing hamlet) is in Loktak Lake in the state of Manipur. It is the largest freshwater lake in India.
- 8 Many fishing villages are not only engaged in fishing but also engaged in art and crafts. They make handicrafts.
- 9 With urbanisation and modernisation, the fishing villages are also changing, they are learning new methods to catch fish. In developed countries, the fishing villages are constantly changing due to the changes in the socioeconomic factors.
- 10 Because of the changes, the traditional economic activity of fishing is affected, people from fishing villages who are educated and skilled, change their profession and engage in other activities as per their interest and training. Hence, the original essence of the fishing villages is somewhat getting lost with the rapidly urbanising world.

Table 2.1.1 Characteristics of the situation of the fishing villages

Type of the fishing village situation	Characteristics	Locating geographical state in India
Small natural harbour	Renders safe location for the development of the hamlet	Maharashtra, Gujarat, Goa, Kerala
On beaches	Safe place for keeping their boats and other equipment	Odisha, Tamil Nadu
On River side confluence with seas	Proximity	West Bengal
Fresh water	Dependency on river or lake species	Manipur

2.4 FISHING VILLAGES IN WORLD

Since times immemorial human civilisations have evolved around the water bodies as water is vital for human survival. It necessary for fulfil day to day requirements of humans, plants and animals. Life cannot be imagined without water. In today's world also, the settlements and industries located near the water bodies are more prosperous, they have more advantages and they develop rapidly. However, there are many communities living near the water bodies since

ages, these are basically fishing communities. There are several reasons for their development at specific locations all over the world. The reasons may be ethnic or occupations.

Here are a few examples,

1 Akwidaa



Figure 2.1 Akwidaa Fishing Village

Source: [https://en.tripadvisor.com.hk/LocationPhotoDirectLink-g479202-d660889-i226934416-Ezile Bay Village-Busua Western Region.html](https://en.tripadvisor.com.hk/LocationPhotoDirectLink-g479202-d660889-i226934416-Ezile_Bay_Village-Busua_Western_Region.html)

It is small city and fishing hamlet located in Ahanta West District. It's a district in the Western Region of South- West Ghana. The main and traditional occupation of people in this hamlet is fishing and related activities.

Many fishing boats can be alongside the beach.

2 Amed



Figure 2.2 Amed Fishing Village

Source: [https://en.tripadvisor.com.hk/Tourism-g608478-Amed Abang Karangasem Bali-Vacations.html](https://en.tripadvisor.com.hk/Tourism-g608478-Amed_Abang_Karangasem_Bali-Vacations.html)

Amed is around 14-kilometre strip of fishing hamlet. It is situated in Karangasem Regency on the east coast of Bali, Indonesia. This village has volcanic sand as it quite close to Mount Agung. It is the largest volcano in Bali.

This small town is focussing on tourism development while simultaneously preserving its tradition and culture. Apart from fishing, free diving, scuba diving, yoga classes and backpacker tourism are also popular here.

3 Chibu



Figure 2.3 Chibu Fishing Village

Source: https://www.facebook.com/TripandTravelBlog/photos/chibu-japan/1423549941058947/?_rdr

Chibu is a small fishing settlement located on Chiburijima in Japan.

They have rich culture and traditions which mainly revolve around fishing. Many festivals are celebrated in this village which are mainly dependent on fishing.

4 Kakapir



Figure 2.4 Kakapir Fishing Village

Source: <https://directory.thecookbook.pk/restaurant/karachi-fish-harbour-west-wharf-karachi-sindh-karachi/>

It's a fishing hamlet in the city of Karachi Harbour in Pakistan. The village is around 100 years old. The village is admist mangrove forests.

5 Myliddy

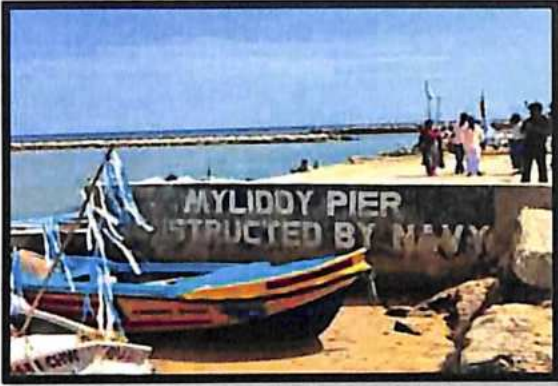


Figure: 2.5 Myliddy Fishing Village

Source: <http://oneislandtwonations.blogspot.com/2017/07/myliddy-harbour-and-lands-released.html>

It's a small town in Sri Lanka. It is referred to as a "typical Jaffna fishing village". This town is popular mainly for its shark fish. It called sura in the native language Tamil.

6 Salemabad



Figure 2.6 Salemabad Fishing Village

Source: <https://www.thenews.com.pk/print/904589-manora-beach-opens-to-public-after-renovation>

It is a fishing village in Manora. It is located in the city of Karanchi in Pakistan. There are mainly ethnic groups in the island. They are connected via. Ferry to the adjoining locations.

7 Po Tai O



Figure: 2.7 Po Tai O Fishing Village

Source: <https://www.streetfoodguy.com/exploring-tai-o-village/>

This a small fishing village situated at Clear Water Bay Peninsula in Hong Kong.

This village has many restaurants. They serve authentic sea food which is major tourist attraction in the village. It has Hung Shing Temple.

8 Tangana

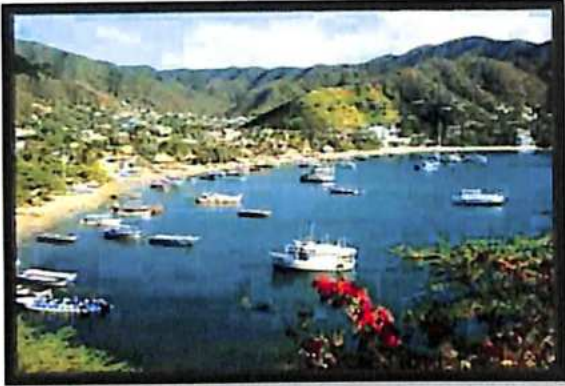


Figure: 2.8 Tangana Fishing Village

Source: <https://tourist2townie.com/adventure-travels/a-quiet-day-in-taganga-colombia/>

It is a traditional fishing village situated in Colombia. Basically, it is located on the Caribbean coast. It is a famous tourist attraction. It is home to Tairona community and enjoys rich and varied biodiversity. The main economic activity of the residents in this village is fishing. Almost all the people in the village are actively involved in this profession. Commercial fishing is done in the area.

9 Lunenburg

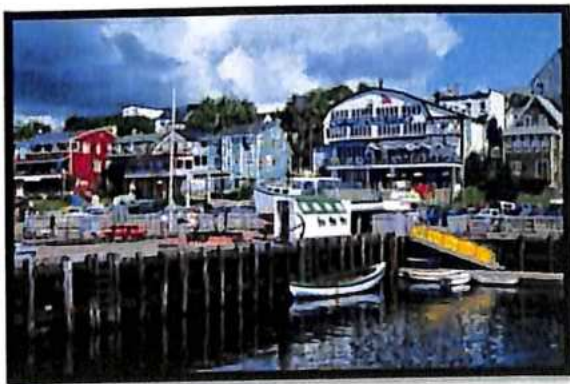


Figure 2.9 Lunenburg Fishing Village

Source: <https://www.britannica.com/place/Lunenburg-Nova-Scotia>

Lunenburg is located on the eastern coast of Nova Scotia. It has beautiful maritime climate throughout the year. It has a population of around 2313 people. It has some well-preserved 18th century buildings, which are also the part of UNSECO World Heritage Site. It has fishery museum and seafood restaurants.

10 Uddapu



Figure 2.10 Uddapu Fishing Village

Source: <https://www.wsws.org/en/articles/2009/02/slud-f10.html>

Uddapu is a small fishing village located in the country of Sri Lanka. It is a traditional Tamil fishing and shrimp fishing village. It has Munneswaram Temple. It is a coastal hamlet alongside the Indian Ocean on the west. Approximately around 15000 people live in this village and the major religion of the village is Hinduism.

2.5 FISHING VILLAGES IN INDIA

Table 2.1.2 Number Of Fishing Villages in India in 2018

Number Of Fishing Villages in India in 2018	
States	Number of Fishing Villages
Odisha	739
Tamil Nadu	575
Andhra Pradesh	533
Maharashtra	526
Gujarat	280
Kerala	220
West Bengal	171
Andaman and Nicobar Islands	169
Karnataka	41
Goa	39
Puducherry	12
Daman and Diu	10
Lakshadweep	7

Source: <https://www.statista.com/statistics/734309/number-of-fishing-villages-by-state-India/#:~:text=In%202018%2C%20the%20eastern%20state.fishing%20villages%20in%20the%20country.>

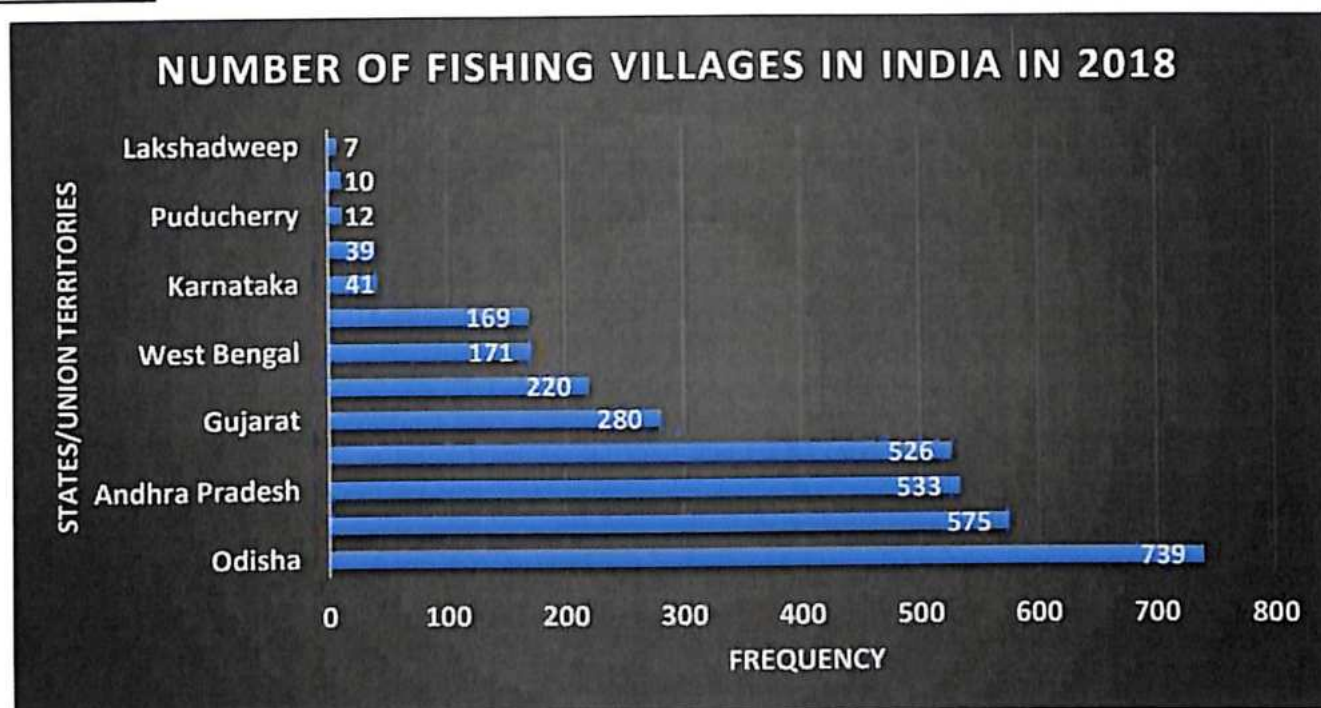


Figure 2.11 Fishing Villages in India in 2018

Table 2.1.2 and figure 2.11 represent the number of fishing villages in India in the year 2018. In India, in the year 2018, the Eastern state of Odisha had the highest number of fishing villages, nearly around 740. The second highest number of fishing villages were reported to be located in the Southern State of Tamil Nadu, followed by Maharashtra, Gujarat, Kerala etc. The least number of fishing villages were in the Union Territory of Lakshadweep.

2.6 STATE WISE FISH PRODUCTION IN INDIA

Table 2.1.3 State wise fish production in India

STATE	FISH PRODUCTION (IN TONNES)
Andhra Pradesh	1930.49
West Bengal	1636.68
Gujarat	793.11
Kerala	664.45
Tamil Nadu	620.51

Source: <http://www.iomenvis.nic.in/>

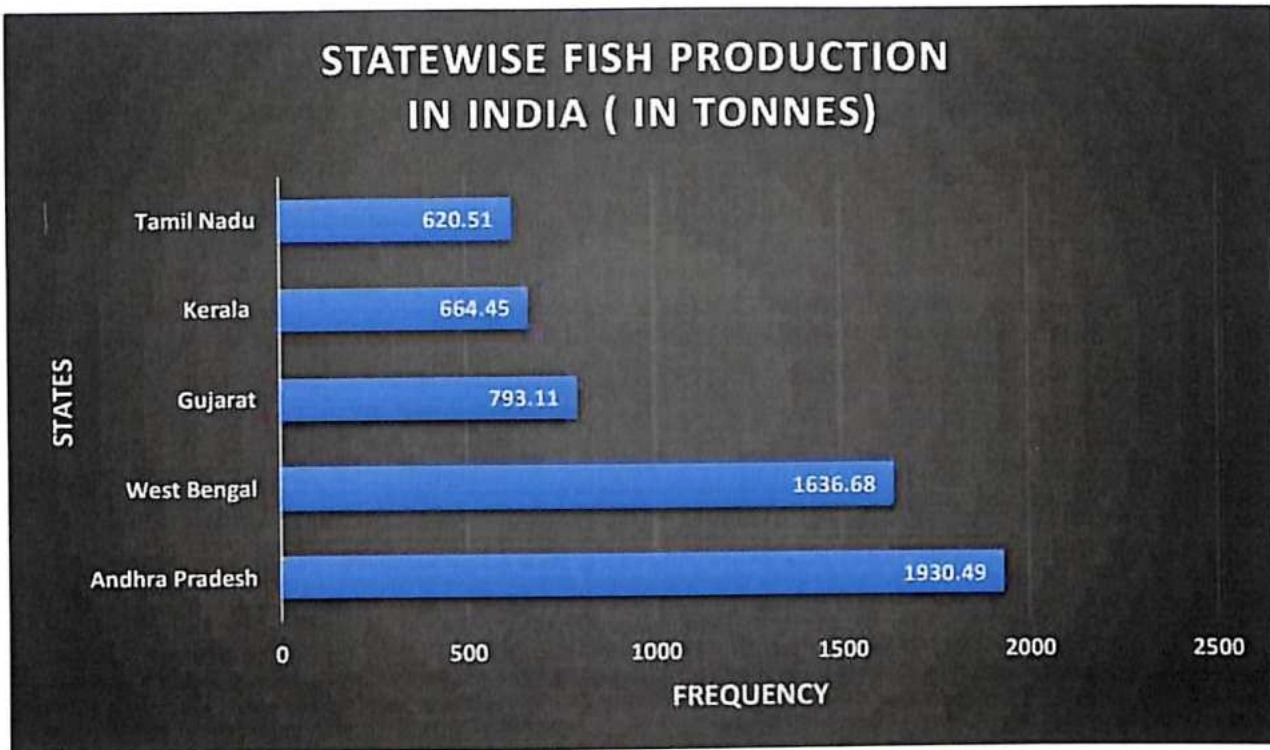


Figure 2.12 State wise fish production in India

Table 2.1.3 and figure 2.12 represent the state wise fish production in India. The above table and figure demonstrate that the southern state of Andhra Pradesh is the leading state in terms of total fish production (in tonnes). The total fish production of Andhra Pradesh is 1930.49 tonnes. Andhra Pradesh is followed by the eastern state of West Bengal with the total fish production of 1636.68 tonnes. Third leading Indian state in terms of fish production is the Western state of Gujarat (793.11 tonnes), followed by Kerala with 664.45 tonnes fish production and Tamil Nadu with 620.51 tonnes. These are the top five leading states of India in terms of fish production.

• **DIFFERENCES IN FISHING ON WESTERN AND EASTERN COAST OF INDIA**

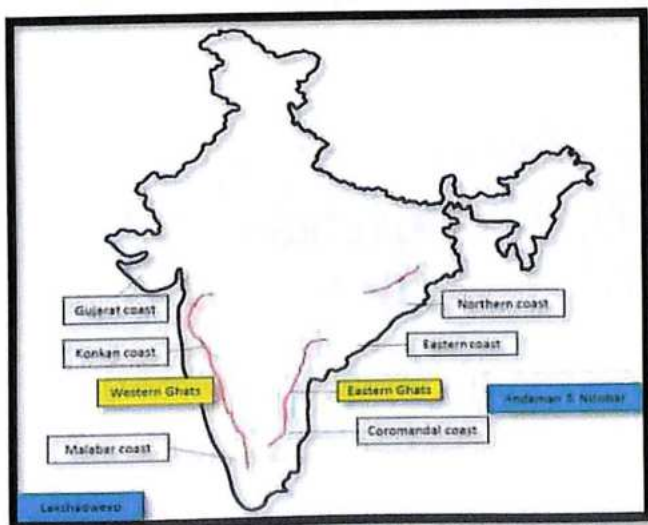


Figure 2.13 Eastern and Western Coastline of India

Globally, India ranks 2nd in Fish Production. The fish production in India was 13.7 million metric tonnes in the year 2018 – 19.

The inland fishing sector contributes 65% of the total fish production. Fish and fish products are the largest groups in the agricultural exports in 2018 – 19.

The value of fish exports was over 47 000 crore rupees.

The fishery sector in India is growing at a great speed from 4.9 % in 2012 -13 to 11.9 % in the year 2017-18.

Keeping in mind the potential in Fish Production, India has combined all the schemes into an umbrella scheme called Blue Revolution. The goal of Blue Revolution is to expand the fish production and productivity (both inland and marine)

In India, Oil Sardines, shrimps, Indian Mackerel etc are mainly fished.

2.8 FIVE MAIN FISHING HARBOURS IN INDIA



Figure 2.15 Five main fishing harbours in India

In India, there are 23 minor fishing harbours and 95 fish landing centres.

2.9 FISHERY PROFILE OF INDIA

• FISHERY RESOURCES

Table 2.1.4 Fishery resources

Marine	
Length of Coastline (km)	8118
Exclusive Economic Zone (EEZ) million Sq. km	2.02
Continental Shelf ('000 sq. km)	530
Number of Fish Landing Centres	1537
No Of Fishing Villages	3432
No of Fisherman Families	874749
Fisher - folk population	4056213
Inland	
Total Inland Water Bodies	73.59
Rivers and canals (km)	195210
Reservoir (Lakh ha)	29.07
Tanks and ponds (Lakh Ha)	24.14

Flood plain lakes / derelict waters (Lakh Ha)	7.98
Brackish water (Lakh Ha)	12.4

Source: State Governments, CIFRI and CMFRI

The length of coastline of India is 8118 km which is quite long and supports fishing at a huge scale. The Exclusive Economic Zone of India is 2.02(million sq., km), the continental shelf is 530 000 sq. km. There are 1537 fish landing centres in India. Fishing villages are 3432, along with 874749 fisherman families. The total population of the fishermen folk i.e., fishing community in India is 4056213 people.

Total inland water bodies in the country are 73.59. The total length of rivers and canals in India are 195210 km. The water reservoir has the area of 29.07 lakh hectares in total. The area of all tanks and fishes in India is 24.14 (lakh hectares) km, flowed by the total area of the brackish water (12.4 lakh hectares) and then comes flood plain lakes with the total area of 7. 98 lakh hectares.

• **FISHERMAN POPULATION (AS PER LIVESTOCK CENSUS, 2003)**

Table 2.1.5 Fishermen population

A) Number of family members		
1	Males	4696158
2	Females	4033963
3	Children	5755233
	Total	14485354
B) Engaged in fishing operations		
1	Full time	933124
2	Part time	1072079
C) Engaged in fishing related activities other than actual fishing		
1	Marketing of fish	391000
2	Repair of fishing Nets	245100
3	Processing of fish	46200
4	Other activities	334700

Source: State Governments, CIFRI and CMFRI

Table 2.1.5 represent the fishing population of India. From the part A of the above table, it is clearly visible that males, females and even children are engaged in fishing and related activities, however the number of males engaged in fishing is quite higher than the number of

females involved in fishing. The total population of all the three groups involved in fishing is 14485354.

Then the part B of the above table represents the number of individuals engaged in full time and part time fishing operations. Around 933124 fishermen are full time involved in this activity. On the other hand, 1072079 people are part time involved in fishing. The reason may be that fishing may not be their main occupation, or they may be students etc.

Part C of the above table represents the population of individuals engaged in fishing related activities but they are not directly involved in fishing. 391000 people are involved in marketing of fish, they just sell the fishes in market. This work is primarily done by the women, 245100 people are involved in repairing nets as nets play crucial role in fishing, nets are pre-requisite for fishing. Hence damage to net has to be repaired immediately otherwise fish catch would be severely affected.

46200 individuals are involved in processing of fishes. They clean the fishes, dry them if needed, store them, etc. 334700 people are involved in all the other fishing related activities apart from the ones discussed above.

So, from the above table. It is clearly visible that millions of people are engaged in fishing and related activities in order to sustain their lives. Indian economy also depends on fishing and related activities. Hence, fishing is a significant economic activity for India's economy.

2.10 FISHERIES IN INDIA

Fisheries play crucial role in economy of India, employing millions of people and contributing to food security of the nation. India has a long coastline of over 8000 kilometres. The Exclusive Economic Zone of India is over 2 million sq. km and it also has extensive freshwater resources such as giant perennial rivers (Ganga and Brahmaputra), Huge lakes (Loktak Lake, Wular Lake etc), ponds etc.

The role of marine fisheries sector is quite significant in India's Food Security.

According to the 2010 census, there are 3288 marine fishing villages, 1511 marine fish landing centres in 9 coastal states (Gujarat, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Odisha and West Bengal) and two Union Territories (Lakshadweep and Andaman & Nicobar Islands).

2.11 STATUS OF FISHING COMMUNITY IN INDIA

As per the Central Marine Fisheries Research Institute (CMFRI) Census of 2010.

- In India, there are approximately around 4 million fishermen. The economic condition of majority of fishermen is miserable. Approximately around 61% of the fishermen live below Poverty Line (BPL).

- In India, among all the fishing communities, the majority of fishing community follows Hinduism (nearly around 76%), followed by Christians (15 %) and then comes the Muslim fishing community (9%).

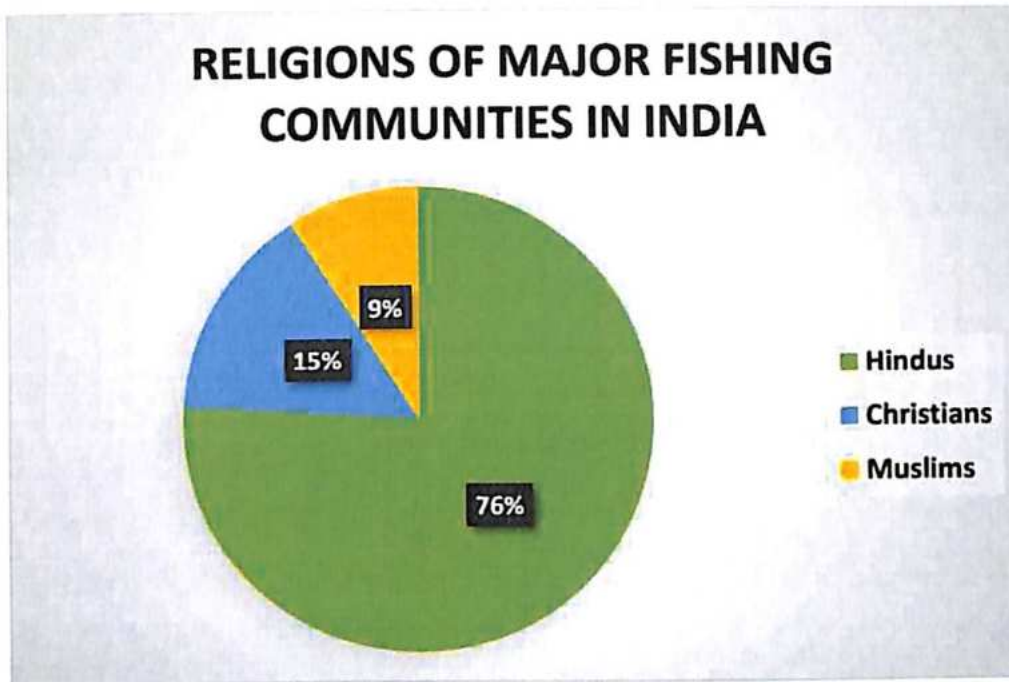


Figure 2.16 Religions of major fishing communities in India

- The total percentage of Schedule Castes/ Schedule Tribes among the marine fishing community is 17%.
- The overall sex ratio in all the fishing communities is 928 females per 100 males. This shows the poor condition of females.
- The average family size of fishermen families is 4.63.
- Around 38% of marine fishing community are engaged in main fishing activity, around 85% of them are fully engaged in this work. On the other hand, around 63.6% of the people from the fishing community are involved in related operations other than fishing.

2.12 STUDY AREA - WORLI KOLIWADA



Figure 2.17 Google Map of Worli Koliwada

Source: <https://www.google.com/maps/place/Koliwada,+Worli,+Mumbai,+Maharashtra/@19.0207966,72.8083591,15z/data=!4m5!3m4!1s0x3be7ceba95889269:0xe2243534b0db911b!8m2!3d19.018226!4d72.8168362>

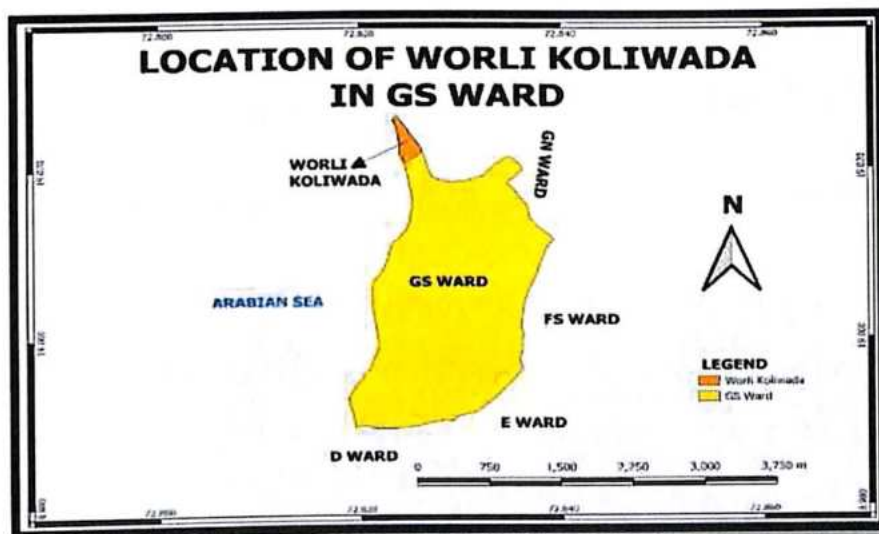


Figure 2.18 Map showing location of Worli Koliwada in GS ward

Worli is small fishing town located in the Worli region of Mumbai city in the state of Maharashtra. It is densely populated settlement and has around 40,000 residents. It is known for its fishing community i.e., the Koli Community. They are the main residents of this place. Worli Koliwada has chawls, a number of small fish markets and fish restaurants.



Figure 2.19 Streets and houses of Worli Koliwada

The latitude and the longitude of the Worli Koliwada are 19.018227° N and 72.816833° E respectively. Worli experiences coastal climate throughout the year.

Latitude	• 19.018227° N
Longitude	• 72.816833° E

Figure 2.20 Geographical coordinates of the Worli Koliwada

2.13 HISTORICAL BACKGROUND OF WORLI KOLIWADA

Worli Koliwada is one of the seven original islands of Mumbai. It is an urban village which has a rich cultural, social and historical importance. It is home to the Koli community who are the indigenous habitants of Mumbai along with the East Indians. They are tribal fisherman with authentic and old fishing techniques which is passes on from one generation to the other.



Figure 2.21 Nets and boats used by the fishing community in the Koliwada

Koli people are residing here for around 800 years now. Majority of the population is Hindu and the Koliwada also has good population of Christian community. They are Koli Catholics who are also engaged in fishing.



Figure 2.22 Religious places of Catholic Kolis

The Koliwada is also home to Bhandari and Agri community, who have more or less similar culture as Kolis. All the residents of Koliwada speak Marathi irrespective of the religion. Pagdi system is prevalent in the Koliwada.

Most of the residents live here for hundreds of years but still live on rent in Pagdi system, paying minimal rents. There are around only 157 landlords in Koliwada, rest of the population lives on rent.

All the festivals celebrated in the Koliwada are celebrated together by the residents of the Koliwada. Both Hindu and Christian Kolis celebrate Holi and Mahashivratri at grand level in the Koliwada. Holi celebrated for three days in the Wada. Huge, beautiful rangolis are prepared by the residents. Traditional Marathi attire is worn on the festivals and people gather in the streets to celebrate the festivals together with great joy and faith. Kolis live in a friendly manner with each other. People from different places come to Worli Koliwada to witness the grandness of the festivals.

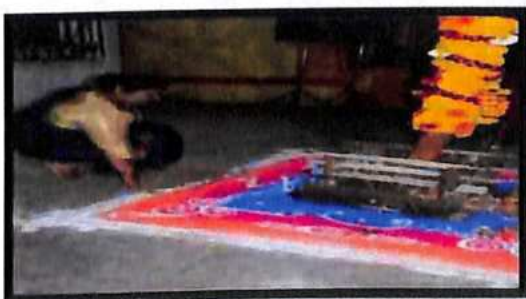


Figure 2.23 Koli woman in traditional Marathi attire making rangoli on the occasion of Mahashivratri

Worli Koliwada also has Worli Fort which was built was the Britishers in the year 1675 and now it is a heritage monument. The Koliwada has number of temples, churches, grottos, jetties, Worlikar houses, jetties and fish markets.



Figure 2.24 Worli fort built by Britishers



Figure 2.25 Main temples in the Worli Koliwada

Worli Koliwada has Cheda Dev Temple which is of great religious significance to the residents of Koliwada. They call it Gram Dev Mandir. The Koliwada residents have deep faith in Cheda Dev. The Cheda Dev temple is located at the entrance of the Koliwada, the inhabitants believe that no evil spirit can enter the Koliwada because of the presence of the Cheda Dev at the entrance of the Koliwada. He protects the Koliwada from all the evil spirits.

Then, Golfa devi Temple is located at the upper part of the Koliwada. She also looks after the needs of the people in the Worli Koliwada. The residents of the Koliwada have deep faith in her. In case of any problem or issue in the lives/families, they visit these temples, and tell their problems to the Purohit in the temple, the Purohit talks with God/Goddess and then tells the solution to them. This is the belief of all the people in the Koliwada.

Apart from these two main temples, there are other important temples such as Hanuman Temple, Shiv Temple, Sai Baba Temple and Vetil Dev temple. All these temples are located

on each side of the Koliwada and they guard the Koliwada from all the sides. Locals believe that because of their blessings and power, nothing wrong happens in the Koliwada. Even in case of cyclones, high tides etc sea water does not enter the Koliwada. They are always safe and protected. They believe that these deities protected and saved them during the period of pandemic and lockdown. Hence, the all the residents of Koliwada are extremely religious and owe a lot to these deities.

2.14 CONCLUSION

This chapter provides detailed information about fishing villages in different countries and also in India. The chapter focusses on the various socio-economic features of the Worli Koliwada. Worli Koliwada is an old settlement with Koli people staying here for hundreds of years. Worli Koliwada has many Hindu temple and churches as well as both Hindu Koli and Christian Koli are the two main religious groups of the Worli Koliwada. Fishing is their age-old profession.

CHAPTER 3

PHYSIOGRAPHIC STUDY OF WORLI KOLIWADA

3.1 INTRODUCTION

Initially, Worli was an isolated island. Originally, Mumbai was a group of seven islands and Worli was also a part of them i.e., it was one of those seven islands. These islands were given By Portuguese to England in the year 1661. These islands were joined together into a single landmass by the Britishers under the Land Reclamation Project in the 19th century.

Today, Worli is located on the eastern side facing Arabian sea and Worli Koliwada is located at the extreme eastern side of the Worli suburb.

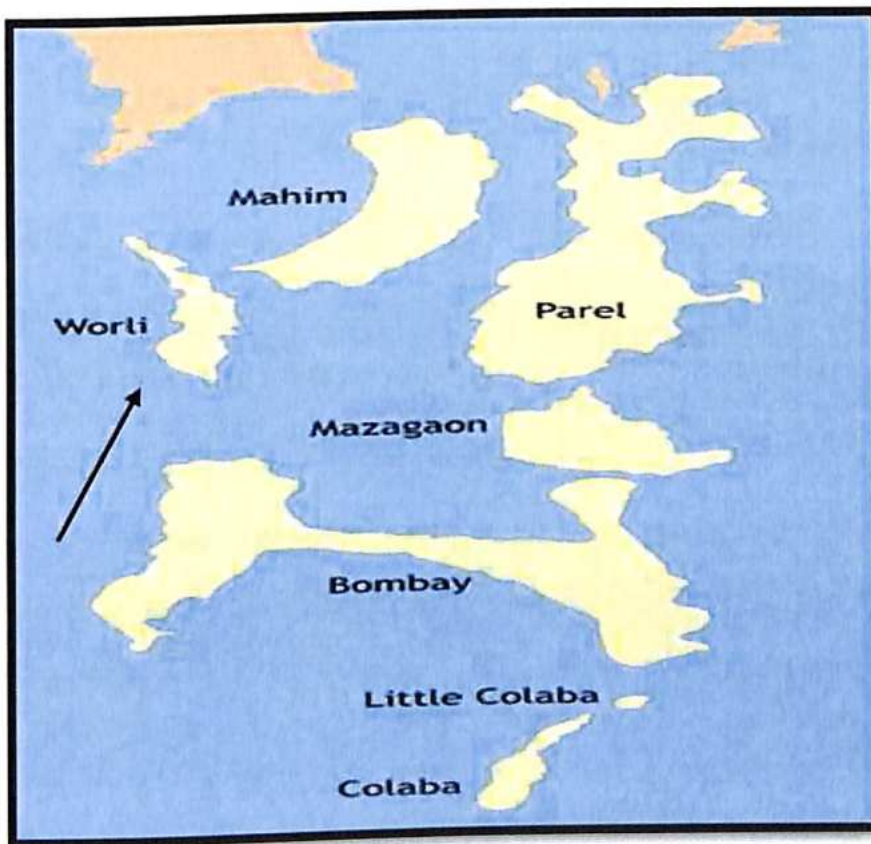


Figure 3.1 Seven Islands comprising Mumbai

3.2 PHYSIOGRAPHY OF WORLI KOLIWADA

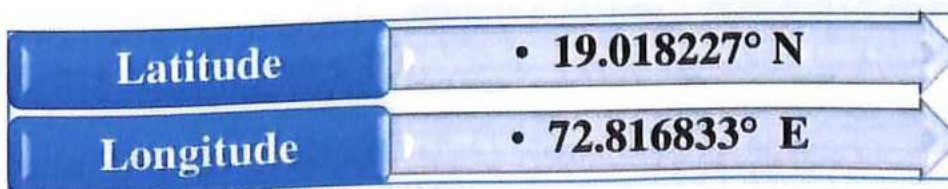


Figure 3.2 Geographical coordinates of the Worli Koliwada

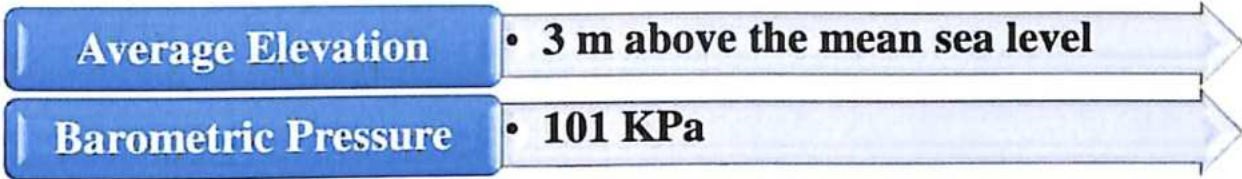


Figure 3.3 Elevation and Barometric Pressure values of Worli Koliwada

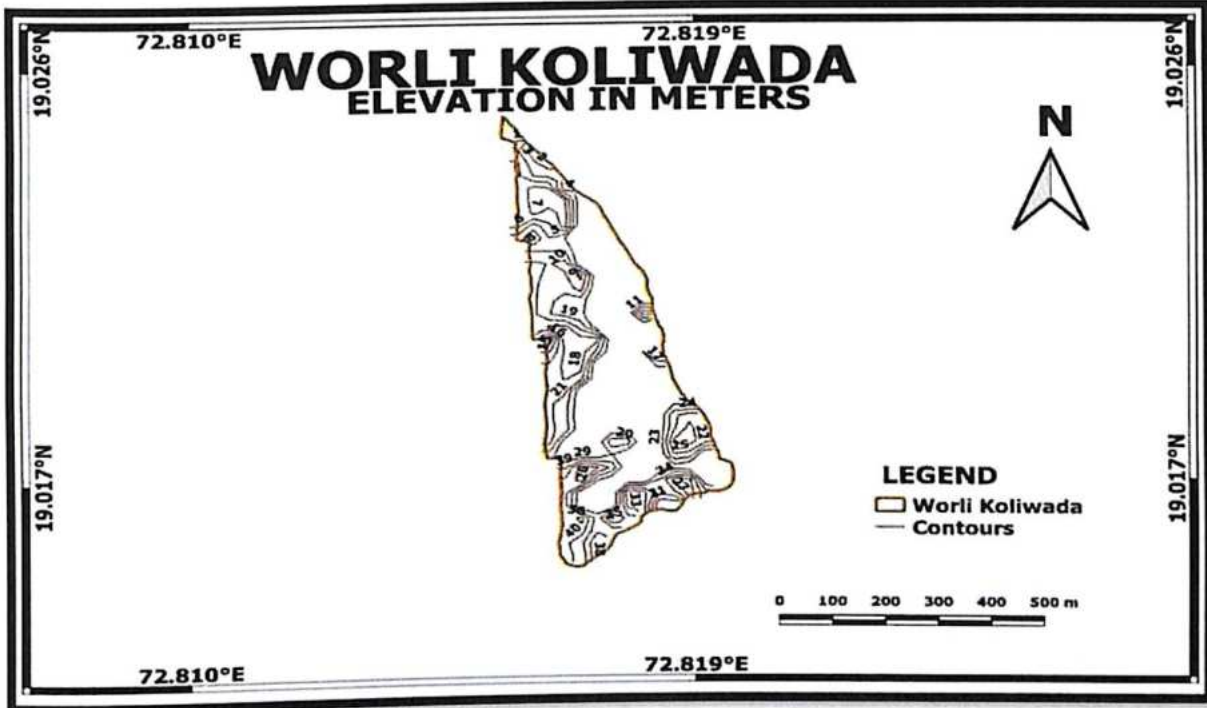


Figure 3.4 Elevation map of Worli Koliwada

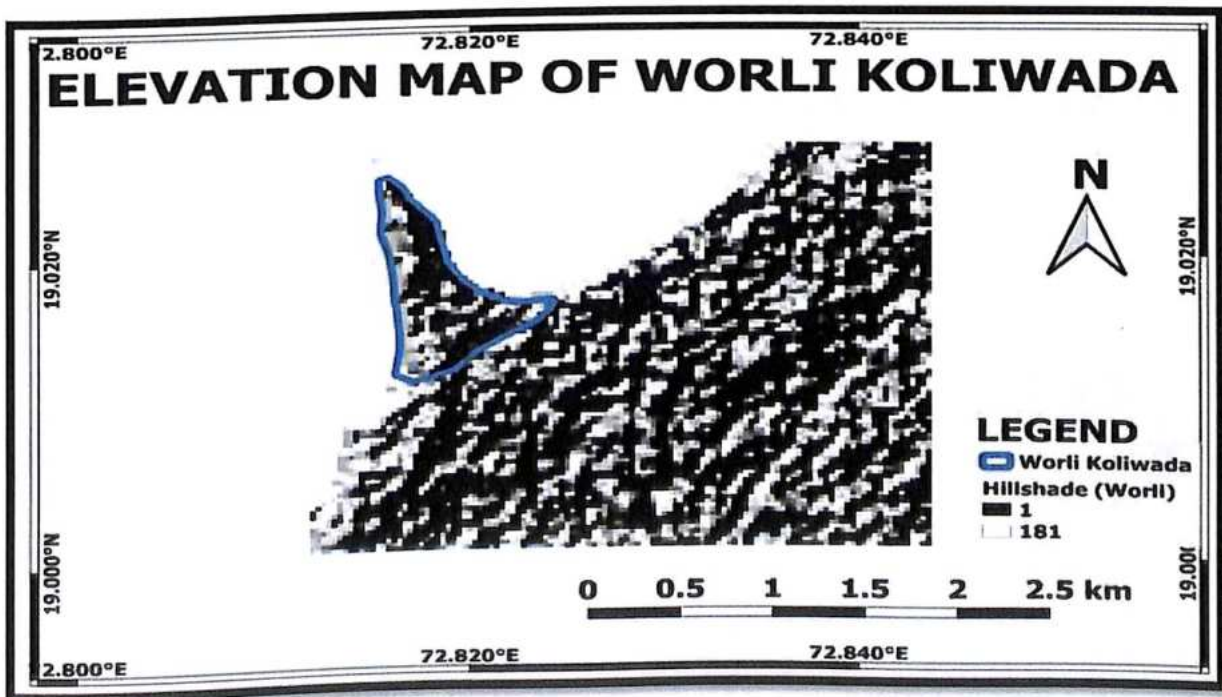


Figure 3.5 Digital Elevation Map of Worli Koliwada

Worli Koliwada is a low-lying coastal region. It has very low elevation as it is a shallow region surrounded by the Arabian Sea on the three sides. Hence, it is ideal location for fishing. This is the main reason why the Worli Koliwada is located at this site. As earlier, it was an island, later on got merged with other six islands of Mumbai to form a single landmass, so one side got merged but the other three sides are still surrounded by the saline water of the Arabian Sea. Banda Worli Sea Link is built on one of the sides and other two sides are developed as jetties. Boats are kept over there and they are the starting point for fishing.



Figure 3.6 Sea Face side (Bandra Worli Sea Link)



Figure 3.7 Second side of the Worli Koliwada (Jetty)

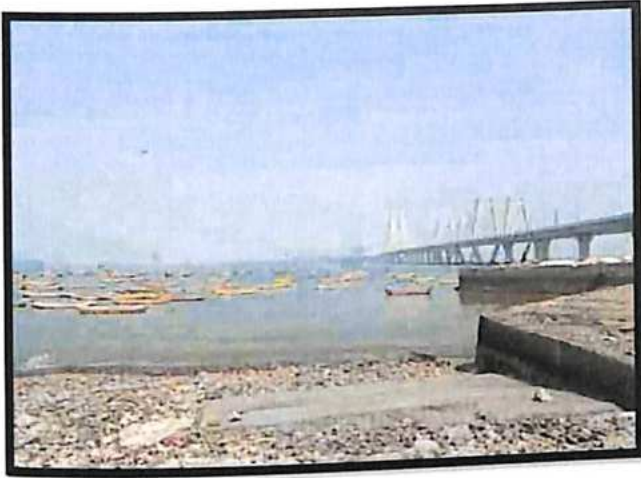


Figure 3.8 Third side of the Worli Koliwada (Jetty)

- **Soil and Rock of Worli Koliwada**

Due to closeness to the Arabian sea, the soil in Worli Koliwada is mostly sandy in texture to a large extent. The Coast of Worli touching the Arabian sea is stony/rocky in nature.



Figure 3.9 Rocky terrain of the Worli Koliwada

Large rocks and stones can be seen spread all over the surface of the Worli Koliwada. These underlying rocks are mainly the Black Deccan Basalt Rocks. Due to this stony texture, this soil is unfit for any type of cultivation, hence people in this region are mainly engaged in fishing since ages. This soil is unfertile and does not hold moisture. These huge rocks present along the shore prevent the sea water to enter the Koliwada during high tides. Thus, they are beneficial for the residents of the Koliwada.



Figure 3.10 Worli Fort surrounded by large rocks



Figure 3.11 Bateri

Figure 3.11 represents Bateri. Bateri is the man – made structure. It is built by the fishing community by arranging the stones in the manner shown in the above figure. The main purpose of building this structure is to let the excess water come to other side of the Bateri towards the shore during the high tide, along with the water the fishes also come but this structure does not allow them to swim back to the sea, hence they are trapped on the other side of the Bateri and the small boats shown in the above figure are used to catch those fish using nets. Hence, Bateri plays an important role in catching fishes during high tides.



Figure 3.12 Fish eating birds are seen near Jetties in the Worli Koliwada

Figure 3.12 represents Great Egret Bird. Many birds of this species are seen in and around the Worli Koliwada as the Koliwada offers them their favourite food which consists of fishes, small snails, amphibians and invertebrates. These are beautiful carnivorous birds with S- shaped necks. They can be easily spotted in the Worli Koliwada especially during morning time when the fishermen catch the fishes. Great Egret Bird is known by many other names such as Great White Egret, Common Egret, Large Egret and Great White Heron.

• **Climate of Worli Koliwada**

The Worli Koliwada basically has tropical climate. During summer months, this place receives more rainfall as compared to the winter months. According to the Kappen’s climatic classification, the climate type in Worli Koliwada is Aw. 26.4 degrees Celsius is the average annual temperature in the Worli Koliwada, this temperature is moderate temperature i.e., neither too high nor too low.

It’s moderate and mostly pleasant for the residents. The reason for moderate annual average temperature is the region’s proximity to the Arabian sea.

Worli Koliwada is located just opposite to the Arabian sea, hence experiences land breeze and sea breeze due to differential heating of land and sea. Due to the prevalence of land and sea breeze in the Worli Koliwada, the region experiences equitable temperature or maritime temperature. Thus, its coastal location is not only advantageous from economic point of view (fishing and related activities) but also significant form geographical point of view.

➤ **AVERAGE MONTHLY TEMPERATURE IN WORLI KOLIWADA (°CELSIUS)**

Table 3.1.1 Average monthly temperature in Worli Koliwada (°Celsius)

Sr. No.	Months	Average Temperature (° Celsius)
1	January	23.9
2	February	24.7
3	March	26.7
4	April	28.2
5	May	29
6	June	27.4
7	July	25.9
8	August	25.6
9	September	26.1
10	October	27.3
11	November	27

Source: <https://en.climate-data.org/asia/India/maharashtra/worli-Koliwada-414090/#:~:text=The%20climate%20is%20tropical%20in.%C2%B0F%20in%20Worli%20Koliwada.>

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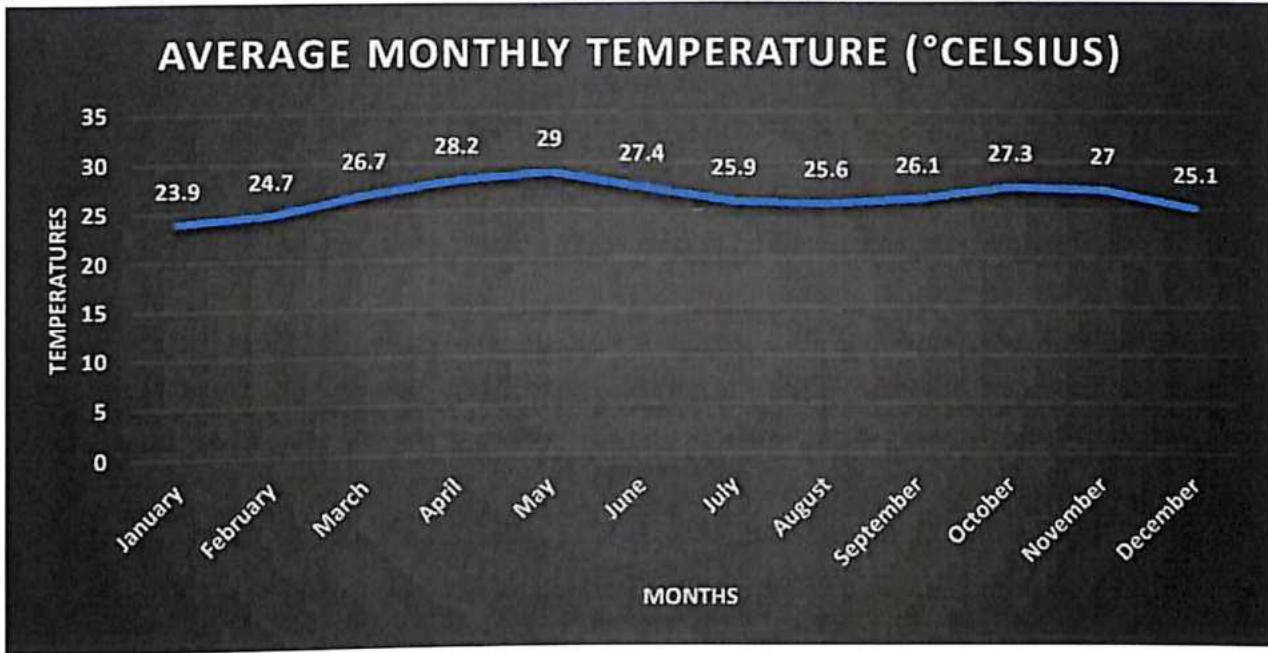


Figure 3.13 Graph showing average monthly temperatures in Worli Koliwada.

Table 3.1.1 and figure 3.13 represent the average monthly temperatures in Worli Koliwada. From the above table and graph, it is clearly visible that January is the coldest month of the year in Worli Koliwada with the average temperature of 23.9°Celsius and May is the hottest month with the average temperature of 29°Celsius. The temperature is more or less same throughout the year without major fluctuations.

Worli Koliwada does not experiences much changes in its average temperature due to its proximity to the Arabian Sea, which plays a crucial role in determining the temperature of the Worli Koliwada. The influence of land and sea breeze moderates the temperature and provide relief to the residents of the Koliwada in the extreme summer months.

➤ MINIMUM MONTHLY TEMPERATURE IN WORLI KOLIWADA(°CELSIUS)

Table 3.1.2 Minimum monthly temperature in Worli Koliwada (°Celsius)

Sr. No.	Months	Minimum Temperature (°Celsius)
1	January	18.8
2	February	19.6
3	March	21.7

4	April	24
5	May	26.2
6	June	25.9
7	July	24.9
8	August	24.5
9	September	24.4
10	October	24
11	November	22.4
12	December	20.1

Source: <https://en.climate-data.org/asia/India/maharashtra/worli-Koliwada-414090/#:~:text=The%20climate%20is%20tropical%20in,%C2%B0F%20in%20Worli%20Koliwada.>

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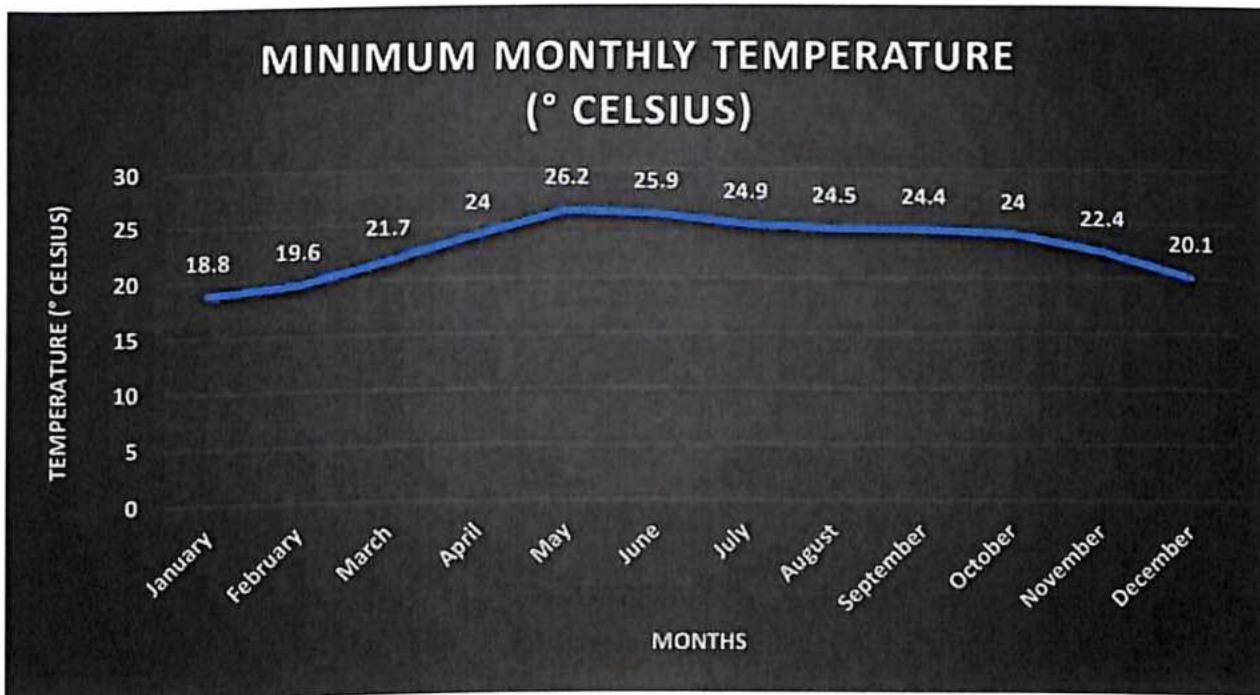


Figure 3.14 Graph showing minimum monthly temperatures in Worli Koliwada

Table 3.1.2 and figure 3.14 represent the minimum monthly temperatures in the Worli Koliwada. From the above table and graph, it is clearly visible that the first month of the year i.e., January has the lowest temperature i.e., 18.8 ° C, then the temperature keeps on increasing with every passing month and the value of the lowest temperature also increases up to May. Thereafter, it then slowly starts to fall from June onwards as summer months get over and rainy season starts hence the heat in the atmosphere is reduced again leading to cooler atmosphere.

➤ **MAXIMUM MONTHLY TEMPERATURE IN WORLI KOLIWADA (° CELSIUS)**

Table 3.1.3 Maximum monthly temperatures in Worli Koliwada

Sr. No.	Months	Maximum Temperature (° Celsius)
1	January	29.4
2	February	30.2
3	March	32
4	April	32.8
5	May	34.4
6	June	29.5
7	July	27.3
8	August	27.2
9	September	28.2
10	October	31
11	November	31.8
12	December	30.5

Source: [https://en.climate-data.org/asia/India/maharashtra/worli-Koliwada-](https://en.climate-data.org/asia/India/maharashtra/worli-Koliwada-414090/#:~:text=The%20climate%20is%20tropical%20in,%C2%B0F%20in%20Worli%20Koliwada.)

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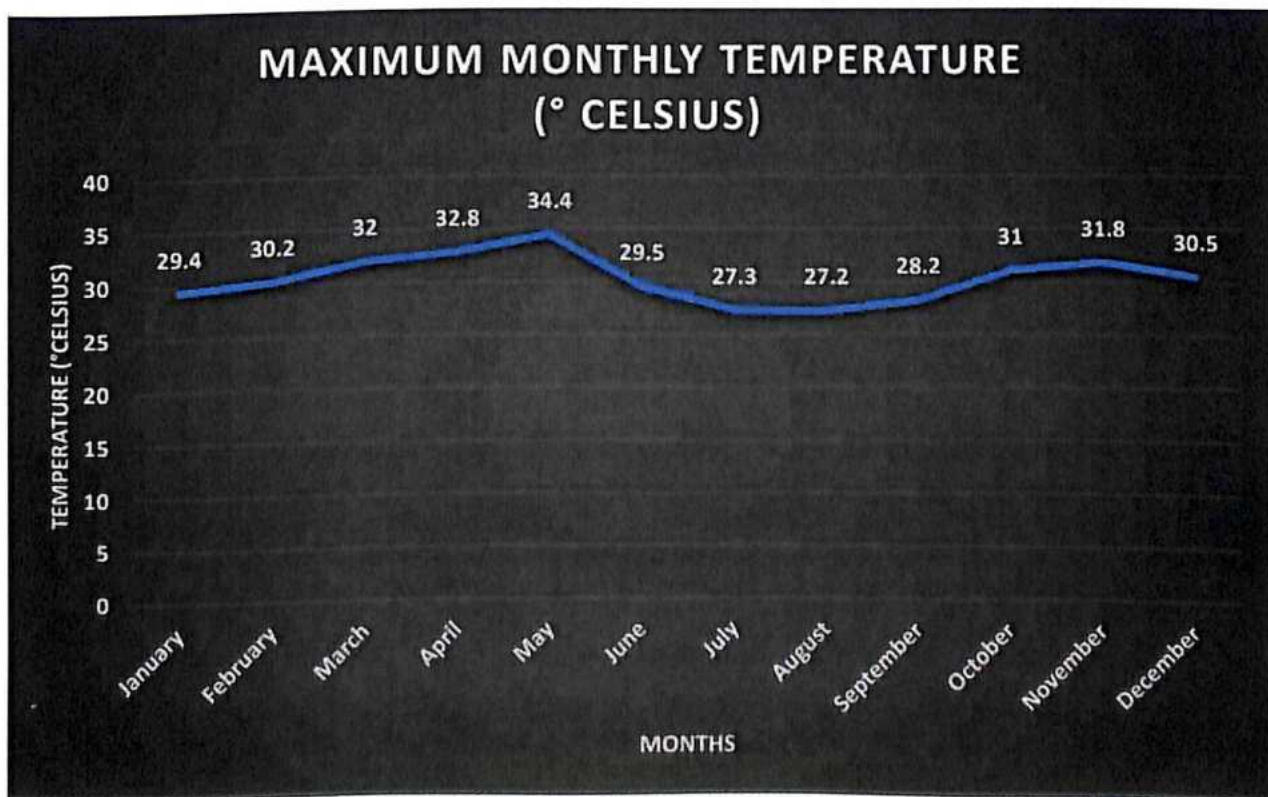


Figure 3.15 Graph showing maximum monthly temperatures in Worli Koliwada

Table 3.1.3 and figure 3.15 represent the maximum monthly temperatures in the Worli Koliwada. From the above table and graph, it is clearly visible that the month of May has the highest temperature i.e., 34.4 ° C. During the month of May, the Worli Koliwada experiences a lot of heat because of insolation, May is followed by the month of April with highest temperature up to 32.8° C.

Summer months are good for fishing, during summer months from March to May, higher number of fishes come to the surface resulting in good fish catch by the Koli Community. Secondly, during summer, the weather is also favourable and comparatively safer for boats to sail smoothly on the sea surface allowing for better fishing experience to the fishermen in the Worli Koliwada.

➤ **PRECIPITATION/RAINFALL IN WORLI KOLIWADA (IN MM)**

Table 3.1.4 Rainfall values (in mm) in Worli Koliwada

Sr. No.	Months	Rainfall / Precipitation (in mm)
1	January	0
2	February	1
3	March	0
4	April	0
5	May	27
6	June	487
7	July	661
8	August	459
9	September	300
10	October	66
11	November	6
12	December	5

Source: [https://en.climate-data.org/asia/India/maharashtra/worli-Koliwada-](https://en.climate-data.org/asia/India/maharashtra/worli-Koliwada-414090/#:~:text=The%20climate%20is%20tropical%20in.%C2%B0F%20in%20Worli%20Koliwada.)

[414090/#:~:text=The%20climate%20is%20tropical%20in.%C2%B0F%20in%20Worli%20Koliwada.](https://en.climate-data.org/asia/India/maharashtra/worli-Koliwada-414090/#:~:text=The%20climate%20is%20tropical%20in.%C2%B0F%20in%20Worli%20Koliwada.)

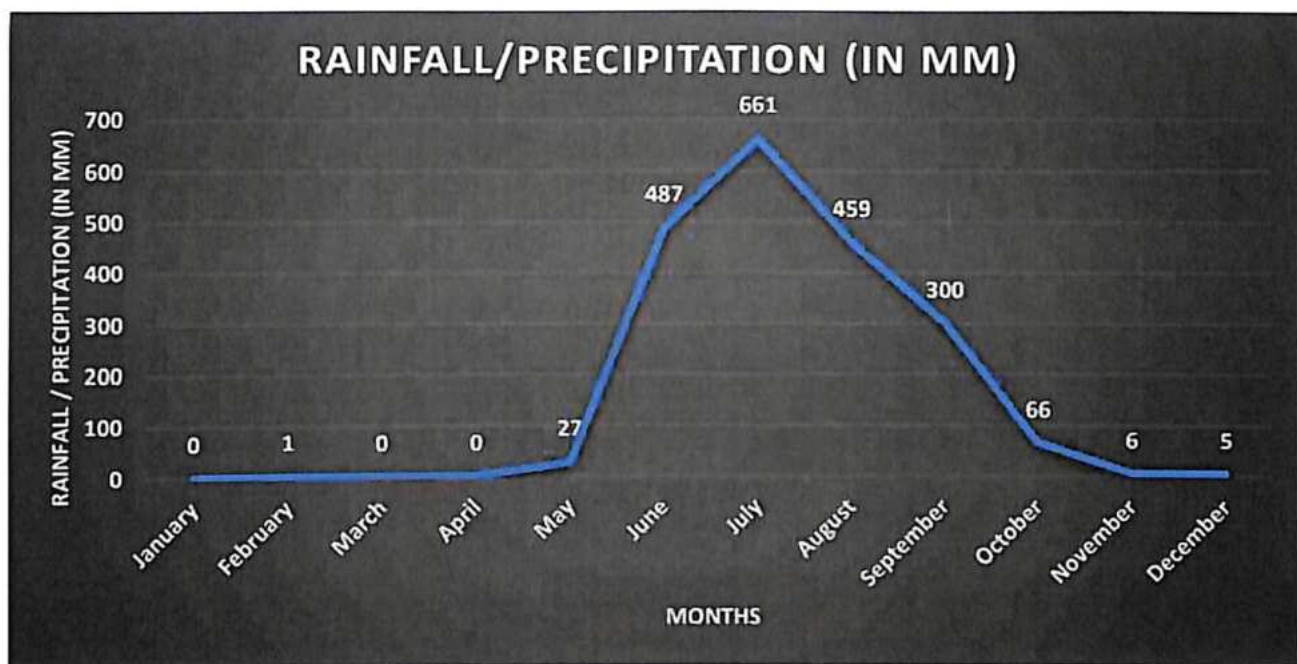


Figure 3.16 Graph showing the rainfall values (in mm) in Worli Koliwada

Table 3.1.4 and figure 3.16 represent the rainfall values (in mm) in Worli Koliwada. From the above table and graph, it is clearly visible that highest rainfall occurs in the month of July in the Worli Koliwada. Its value is 661 mm, followed by the rainy month of August with rainfall value of 459 mm. It means that the month of July is the wettest month of the year and the months of January, March and April are the driest months of the year.

Annual rainfall in the Worli Koliwada is 2012 mm.

HUMIDITY IN WORLI KOLIWADA (%)

Table 3.1.5 Monthly humidity values (in mm) in Worli Koliwada

Sr. No	Months	Humidity (%)
1	January	58
2	February	59
3	March	60
4	April	68
5	May	72
6	June	83
7	July	89
8	August	89
9	September	86
10	October	74
11	November	60

Source: <https://en.climate-data.org/asia/India/maharashtra/worli-Koliwada-414090/#:~:text=The%20climate%20is%20tropical%20in.%C2%B0F%20in%20Worli%20Koliwada.>

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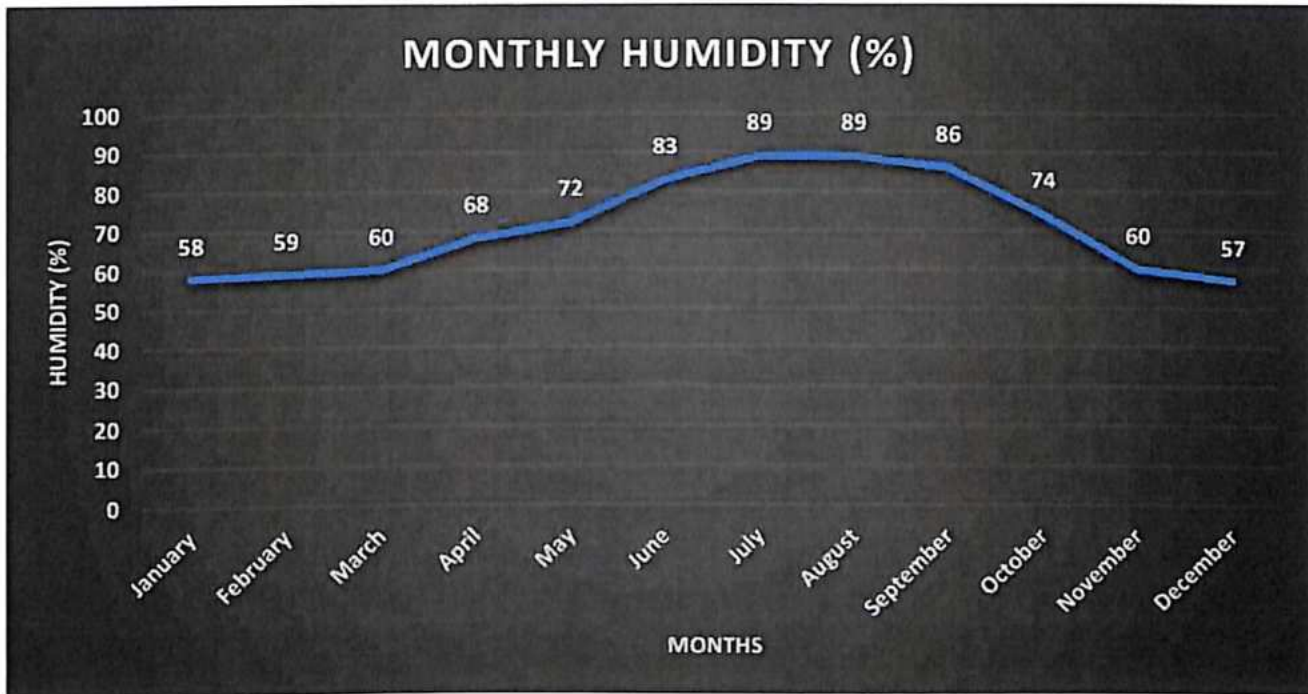


Figure 3.17 Graph showing the monthly humidity values (in mm) in Worli Koliwada

Table 3.1.5 and figure 3.17 represent the monthly humidity values in the Worli Koliwada. From the above table and graph, it is clearly visible that the rainy months have the highest humidity. During the wettest months of July and August, humidity reaches up to 89 %, which is quite high.

The winter month of December has the lowest humidity with the value 57 % but it is quite obvious from the table and graph that the Worli Koliwada always has the humidity above 50 % throughout the year as it is located very close to the huge water body i.e., Arabian sea and also it is surrounded by water on all its three sides, resulting in humidity always above 50%.

▶ RAINY DAYS IN WORLI KOLIWADA

Table 3.1.6 Number of rainy days in Worli Koliwada

Sr. No.	Months	Number of Rainy days in a month
1	January	0
2	February	0
3	March	0
4	April	0

5	May	3
6	June	18
7	July	22
8	August	22
9	September	18
10	October	6
11	November	1
12	December	0

Source: <https://en.climate-data.org/asia/India/maharashtra/worli-Koliwada-414090/#:~:text=The%20climate%20is%20tropical%20in.%C2%B0F%20in%20Worli%20Koliwada.>

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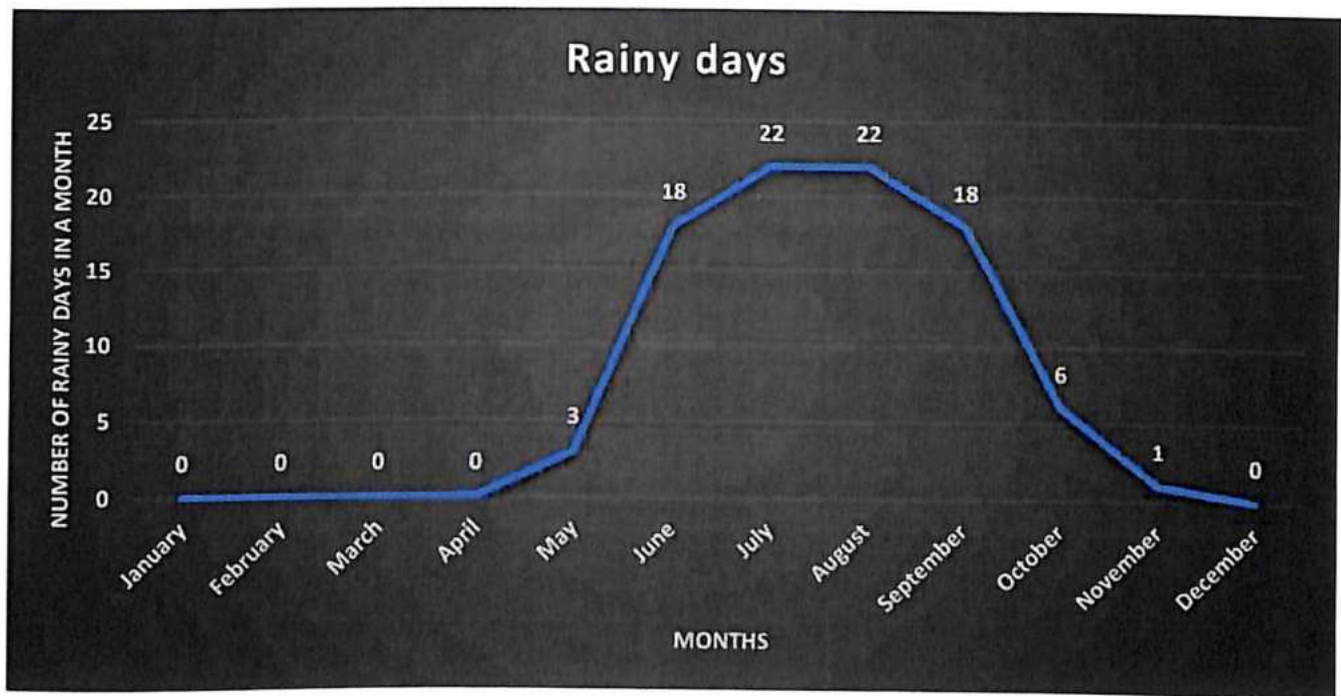


Figure 3.18 Graph showing the number of rainy days in Worli Koliwada

Table 3.1.6 and figure 3.18 represent the number of rainy days in the Worli Koliwada. From the above table and graph, it is clearly visible that the months of July and August have the highest number of rainy days i.e., as high as 22 rainy days in a month. These two months are followed by the months of June and September when the total number of rainy days reduce to 18 days and in rest of the months these values keep on decreasing. The starting four months of the year are the driest months of the year without even a single rainy day.

Rainy season or months having a greater number of rainy days are unfavourable for fishermen as during this period, the government prohibits the fishermen to fish as this is the breeding

period for majority of fish species, during this period only their population increase after breeding, hence the fishermen aren't allowed to fish during the rainy season. Also, during the days with extremely heavy showers and high speed winds, fishing becomes a risky task as the boats may hit the pillars of coastal projects or they may overturn etc. So, the chances of mishap on seas increase on days with bad weather (cyclonic days). This is also a major reason for the government to ban fishing on such days as it may prove to be life threatening to the fishermen. So, during rainy season many fishermen become unemployed by losing their means of livelihood, hence they are forced to switch to other seasonal professions to earn their daily wages and sustain their income.

➤ **SUN HOURS IN WORLI KOLIWADA (HOURS)**

Table 3.1.7 Sun hours in Worli Koliwada

Sr. No.	Months	Sun hours (hours)
1	January	9.9
2	February	10.1
3	March	10.5
4	April	10.6
5	May	9.9
6	June	8.8
7	July	8.8
8	August	9
9	September	8.5
10	October	9.7
11	November	10
12	December	9.8

Source: [https://en.climate-data.org/asia/India/maharashtra/worli-Koliwada-](https://en.climate-data.org/asia/India/maharashtra/worli-Koliwada-414090/#:~:text=The%20climate%20is%20tropical%20in.%C2%B0F%20in%20Worli%20Koliwada.)

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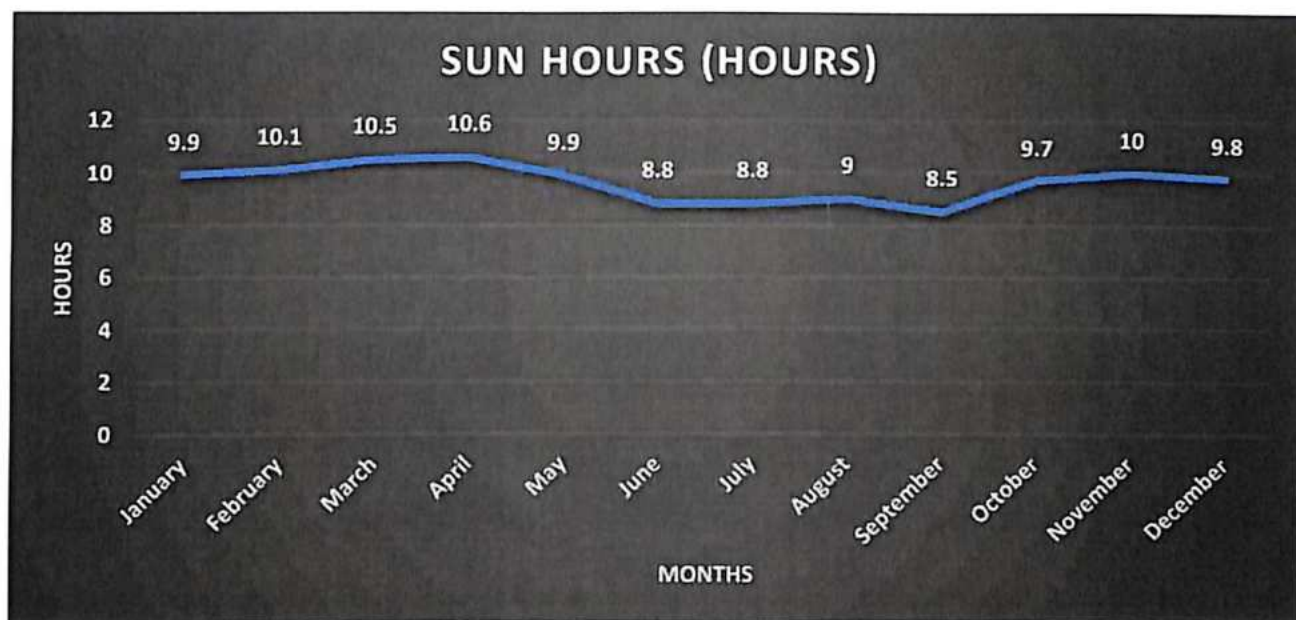


Figure 3.19 Graph showing sun hours in Worli Koliwada

Table 3.1.7 and figure 3.19 represent the sun hours in the Worli Koliwada. From the above table and graph, it is clearly visible that the month of April has the highest number of summer months i.e., 10.6 hours per day, April is followed by the month of March 10.5 hours per day. The duration of sun hours steadily decreases during the rainy months and from October, it again starts to gradually rise. The month of September has the lowest duration of sunlight i.e., 8.5 hours per day.

➤ **MINIMUM WATER TEMPERATURE IN WORLI KOLIWADA (° CELSIUS)**

Table 3.1.8 Minimum water temperature in Worli Koliwada

Sr. No.	Months	Minimum Water Temperature (° Celsius)
1	January	24.8
2	February	24.8
3	March	25.9
4	April	27.9
5	May	29.3
6	June	28.9
7	July	27.8
8	August	27.5
9	September	27.9
10	October	28.5
11	November	27.4
12	December	25.8

Source: <https://en.climate-data.org/asia/India/maharashtra/worli-Koliwada-414090/#:~:text=The%20climate%20is%20tropical%20in.%C2%B0F%20in%20Worli%20Koliwada.>

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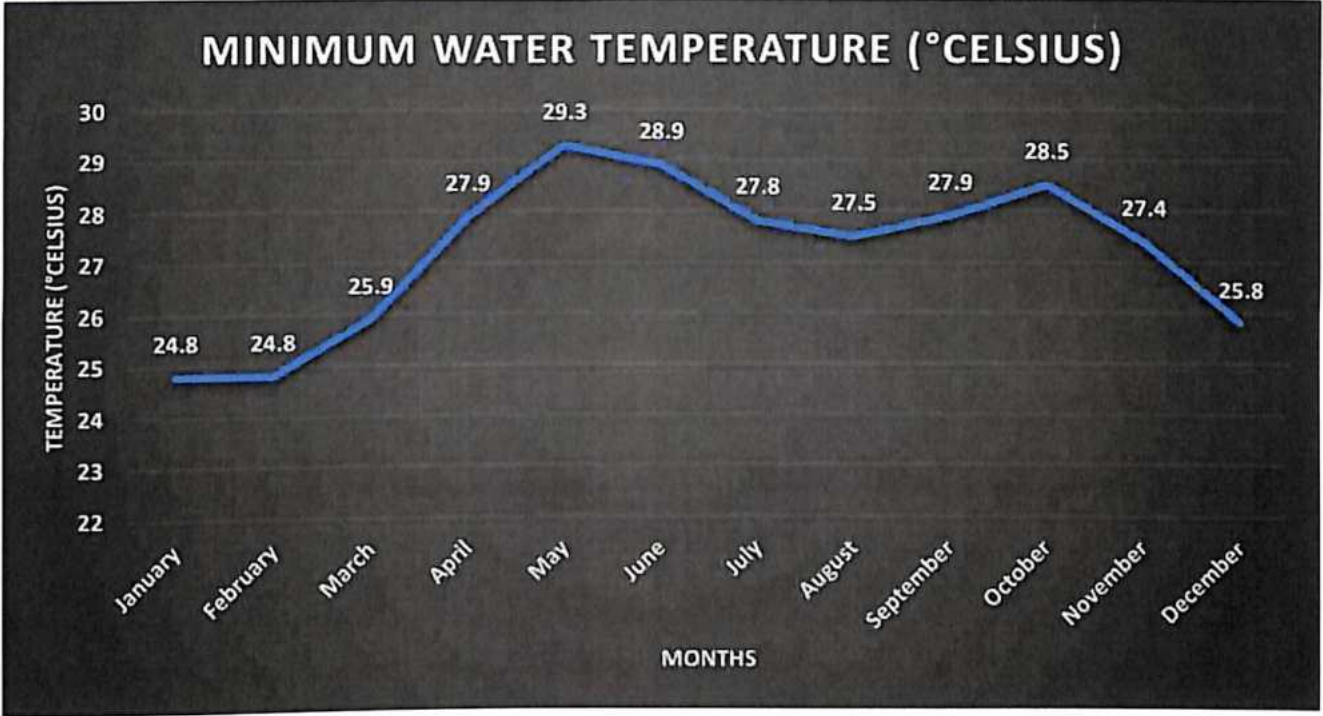


Figure 3.20 Graph showing the minimum temperature of water in Worli Koliwada

Table 3.1.8 and figure 3.20 represent the minimum temperature of water in the Worli Koliwada (The Worli Koliwada is surrounded by water on three sides). From the above table and graph, it is clearly visible that during the month of May, even the water temperature is the highest i.e., 29.3° C and during the winter months of January and February, the water temperature falls up to 24.8 ° C which is the lowest values when compared to rest of the months of the year.

➤ **MAXIMUM WATER TEMPERATURE IN WORLI KOLIWADA (° CELSIUS)**

Table 3.1.9 Maximum temperature of water in Worli Koliwada

Sr. No	Months	Maximum Water Temperature (° Celsius)
1	January	25.6
2	February	25.9
3	March	27.7
4	April	29.2
5	May	30.1
6	June	30.2
7	July	28.9
8	August	28

9	September	28.7
10	October	29
11	November	28.5
12	December	27.3

Source: <https://en.climate-data.org/asia/India/maharashtra/worli-Koliwada-414090/#:~:text=The%20climate%20is%20tropical%20in,%C2%B0F%20in%20Worli%20Koliwada.>

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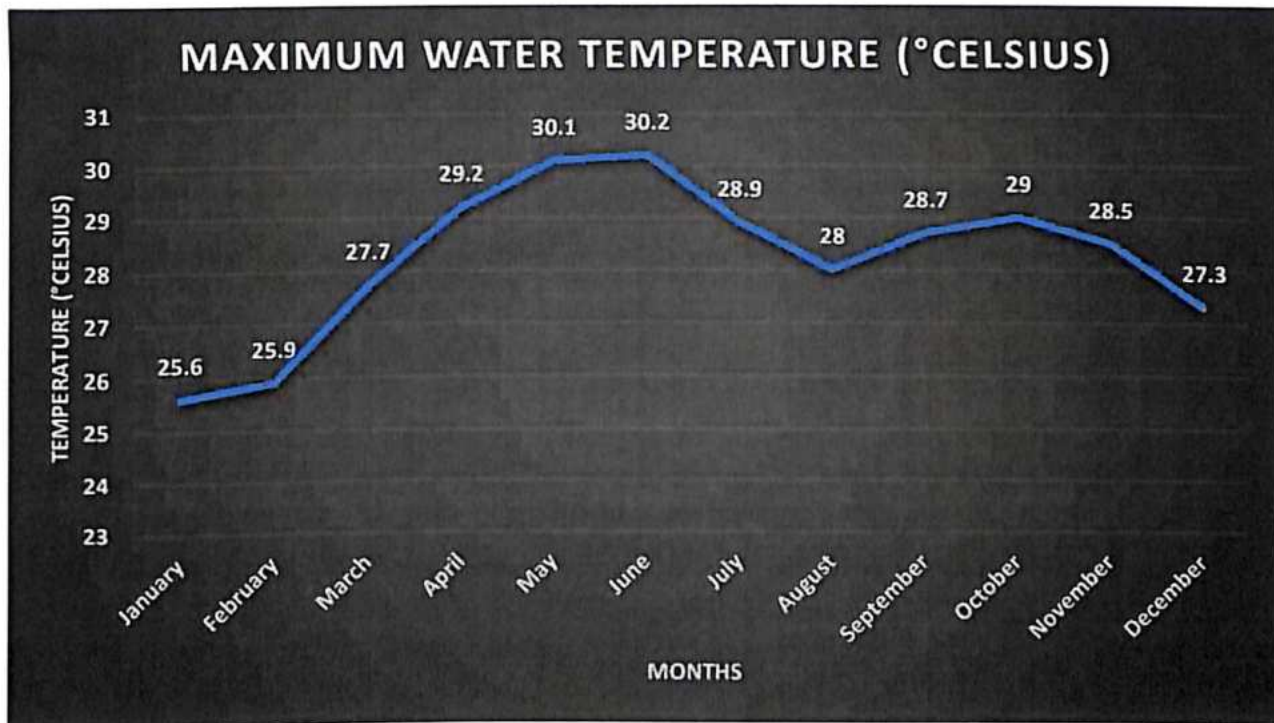


Figure 3.21 Graph showing the maximum temperature of water in Worli Koliwada

Table 3.1.9 and figure 3.21 represent the maximum temperature of water in the Worli Koliwada (The Worli Koliwada is surrounded by water on three sides). From the above table and graph, it is clearly visible that during the month of June, the water temperature is maximum at around 30.2°C.

AVERAGE WATER TEMPERATURE IN WORLI KOLIWADA (° CELSIUS)

Table 3.1.10 Average temperature of water in Worli Koliwada

Sr. No	Months	Average Water Temperature (°Celsius)
1	January	25.1
2	February	25.2
3	March	26.7
4	April	28.6

community engaged in fishing and related activities. However, rainy season is good for fishing as this is the breeding period of the fishes, so after rains the fish population increases significantly.

The Worli Koliwada has more or less rough terrains with sloping surface. The elevation of the Koliwada is highest in the eastern part near Golfa Devi Mandir. The sand in this area is also somewhat rocky and infertile to support farming. Hence, fishing is the ideal occupation in the region.

CHAPTER 4

SOCIO-ECONOMIC STUDY OF WORLI KOLIWADA

4.1 INTRODUCTION

The attempt in this study has been to understand and elaborate the status and the socioeconomic profile of the Koliwada residents on Worli physical area. This is a fishing village is a place where a fishing community lives, mostly along a water body. Fishing village may be located along a river, pond or on sea shore. There are a number of fishing villages all across the world. Fishing villages have different fishing communities. Fish is the staple food of the people in fishing villages. Fishing communities are crucial for supporting India's economy. In the process of the survey conducted by the investigator, several interesting aspects have been found which show case a unique cultural milieu in the heart of the city of Mumbai. In this chapter, the socio-economic aspects of lives of the residents of Worli Koliwada will be discussed.

4.2 DISCUSSIONS

The area under study is the Worli Koliwada region which is located in the southern part of the city and the dwellers have inhabited the place for over 300 years. The reason of selection of this study area is to emphasize the need to retain and sustain fishing as an economic activity in the city of Mumbai.

4.2.1 OBJECTIVE OF THE SURVEY

The primary objective of the research is to understand the physiographical and socioeconomic aspects of Worli Koliwada. The study area includes the entire region of the Worli Koliwada. The study has hence been divided into physiographic elements and the socioeconomic study based on a set number of questions devised in the questionnaire.

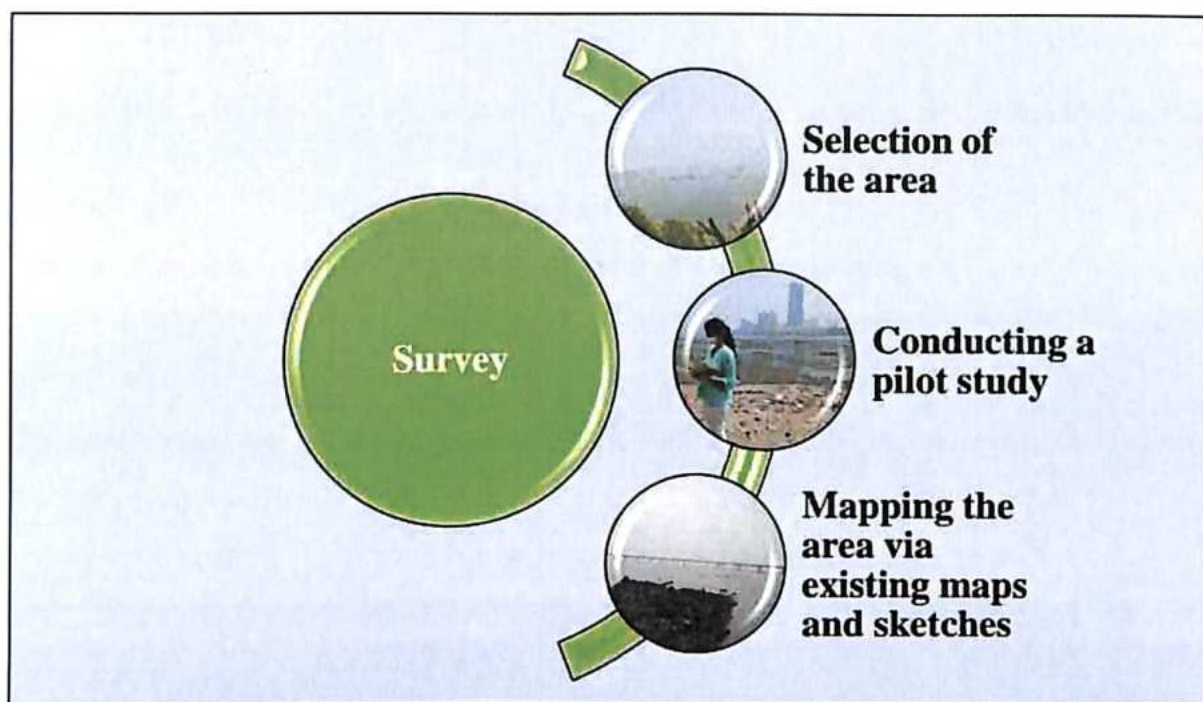


Figure 4.1 Steps before undertaking survey

4.2.2 SELECTIVE PLAN OF WORK

The plan of work for this study was: -

1. Preparing a well-structured questionnaire based on the above-mentioned objectives.
2. Making a proper plan for conducting the research.
3. Visiting the study area for primary data collection.

Table 4.1.1 Summary of data collection

Sr. No.	Date of Survey	No. of respondents	Remarks
1	18-02-2022	15	Respondents were friendly and cooperative while surveying
2	20-02-2022	20	Respondents were friendly and cooperative while surveying
3	23-02-2022	15	Respondents were friendly and cooperative while surveying
4	03-03-2022	10	Majority of the respondents were unfriendly and uncooperative
5	08-03-2022	30	Some were hesitating to reply to some of the questions

6	11-03-2022	10	Respondents were friendly and cooperative while surveying
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4.2.3 QUESTIONNAIRE OF THE STUDY

The questionnaire used for the survey had the following key points.

- Personal details of the respondents (age, educational qualifications, religion, ownership of houses, etc)
- Their traditional and main economic activities currently.
- Socioeconomic problems of the residents of the Worli Koliwada.
- Questions related to any lifestyle issue especially because of fishing occupation.

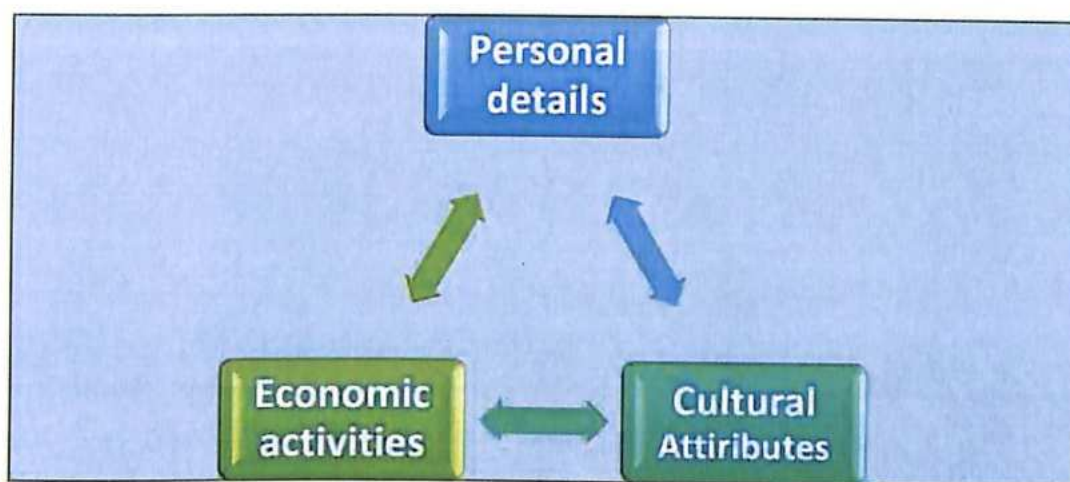


Figure 4.2 Main constituents of the survey

4.2.4 METHOD USED FOR SURVEYING

The survey was done in the Koliwada to gather primary information about the residents of the Worli Koliwada. In order to conduct the survey efficiently and without any bias, two methods were adopted primarily. Randomly sampling method was used to select the targets for asking questions. The respondents were the residents of the Koliwada, both the indigenous Koli community as well as migrants. Sample size for the research was 100.

People were asked questions and also their behaviour was observed. For this naturalistic observation method was used. Hence the behaviour of people in Koliwada was observed while they were doing different activities according to their daily routine. Significant points from the behaviour were noted in order to support the responses.

4.2.5 DATA INTERPRETATION AND ANALYSIS

• Gender:

Question about gender wasn't asked to the respondents as it would be very embarrassing to ask such question to the respondents, they might get offended which would prevent them from

participating in the survey. Hence, gender was written by looking at their physical appearance and behaviour.

The data about gender has been analysed and presented in the table 4.2.2 and figure 4.3 below.

Table 4.2.2 Gender wise data of the respondents

Sr. No	Gender	Frequency
1	Male	57
2	Female	43

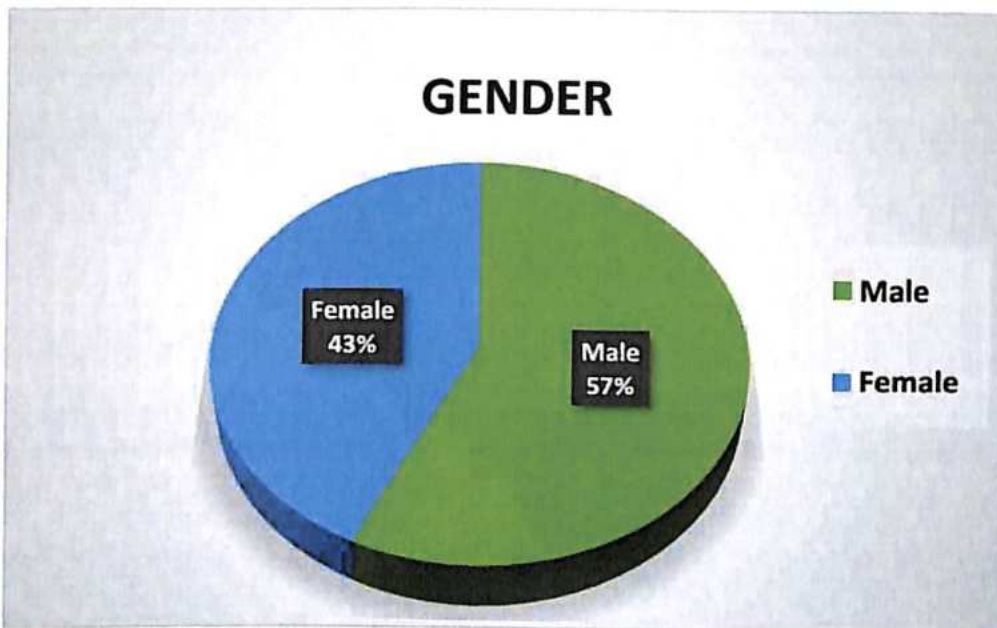


Figure 4.3 Graph representing the gender wise data of the respondents

Table 4.2.2 and figure 4.3 represent the gender wise data of the respondents of the Koliwada. Total 100 samples were surveyed. Out of 100 sample, 57 were males and 43 respondents were females. It can be observed that the female participation is less in the survey. Majority of females were hesitant to reply to all the questions of the questionnaire. Some stopped answering in between, some of them even refused to participate in the survey. One of the major reasons could be lack of time. Most of them were busy in selling fish in the fish market. Fishing is primarily done by men and selling those fishes is traditional occupation of women.

- **Age Group:**

Age group is one of the most crucial variables in the social science research. A question about the age was asked to the residents of the Koliwada. The age groups of the respondents have been analysed and presented in the table 4.2.3 and figure 4.4.

Table 4.2.3 Age wise data of the respondents

Sr. No	Years	Frequency
1	Less than 20	18
2	20 -40	35
3	40-60	28
4	Above 60	19

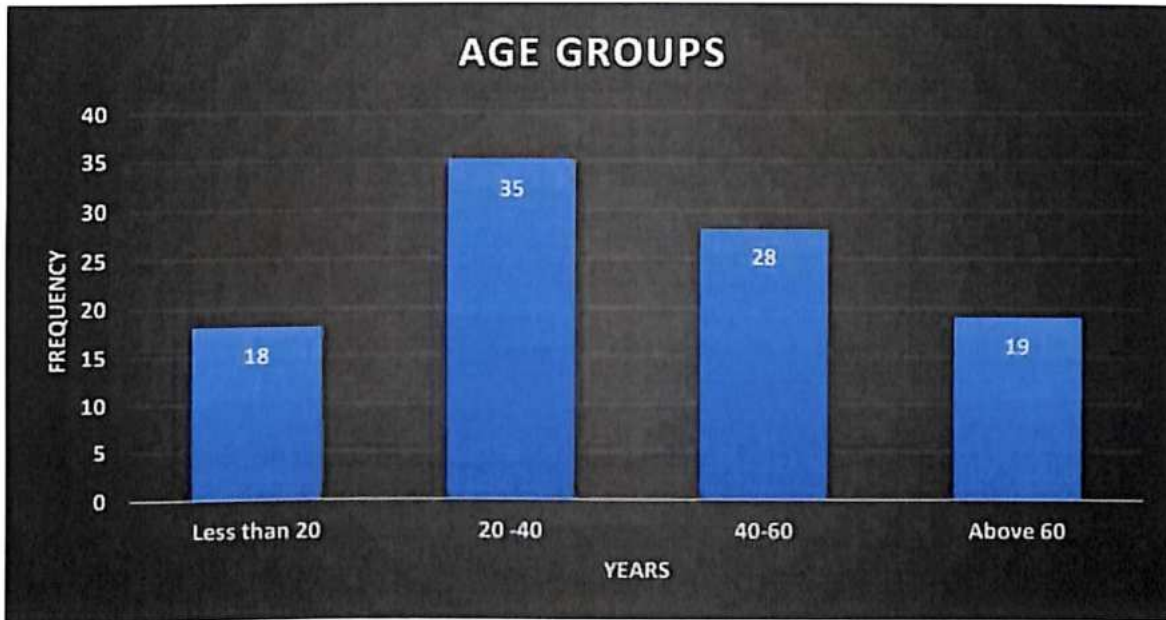


Figure 4.4 Graph representing the age wise data of the respondents

Table 4.2.3 and figure 4.4 represent the age wise distribution of the respondents in the Worli Koliwada. As mentioned before, total 100 respondents were surveyed. Out of 100 respondents, 18 respondents were less than 20 years of age, 35 respondents were in the age group of 20 -40, 28 respondents were in the age group of 40 -60 and 19 respondents were in the age group of above 60.

Thus, from the above table and figure, it can be concluded that majority of the respondents were in the age group of 20 – 40 and the least number of respondents were less than 20 years of age.

• **Educational Qualification of the respondents:**

After asking about the age group, the respondents were asked about their educational qualifications. The data about educational qualification has been analysed and represented in the table 4.2.4 and figure 4.5.

Table 4.2.4 Educational qualifications of the respondents

Sr. No.	Educational Qualifications	Frequency
1	Illiterate	4
2	Primary	10
3	Secondary	15
4	High School	20
5	Graduate	29
6	Post graduate	20
7	Ph D	2

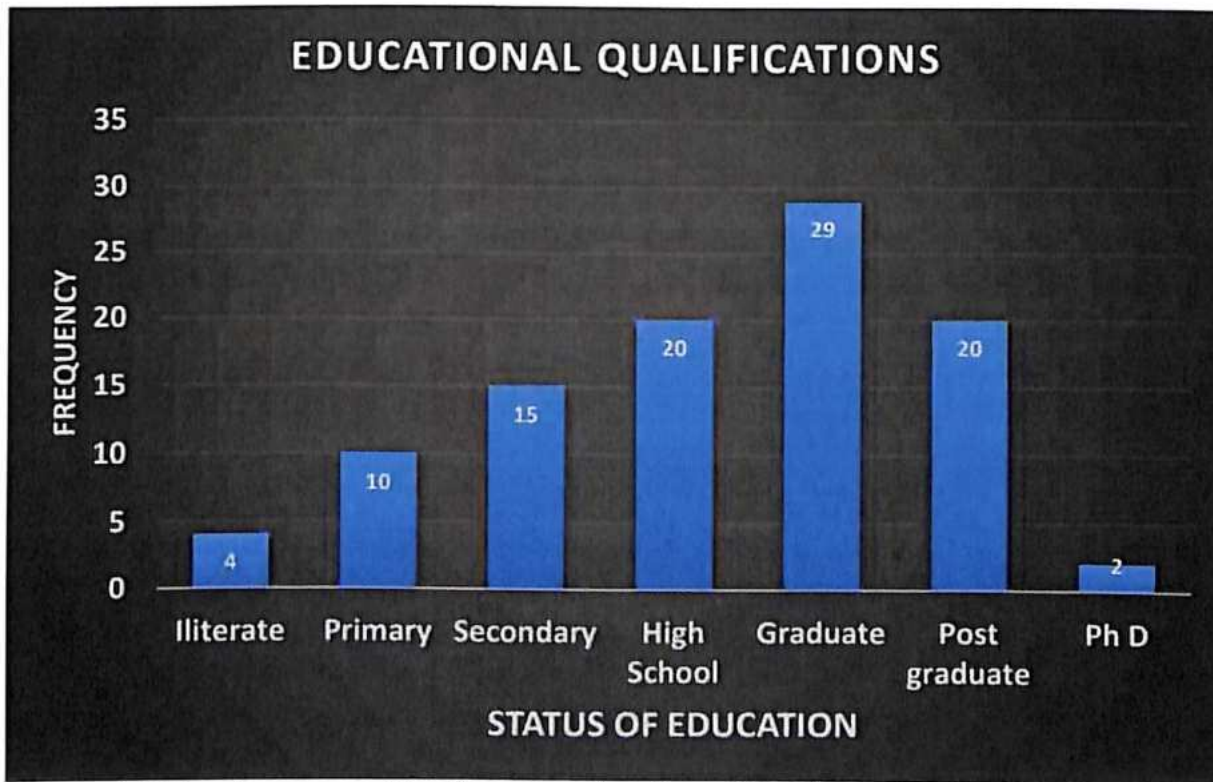


Figure 4.5 Graph representing the educational qualifications of the respondents

Table 4.2.4 and figure 4.5 represent the educational qualifications of the respondents surveyed in the Worli Koliwada. The above table and figure represent that only 4 respondents were illiterate, 10 respondents had primary education, 15 respondents had secondary education. Then, out of 100, 20 respondents gained education till high school, then 29 respondents went to college for graduation. 20 respondents were post graduate and only 2 out of 100 were Ph D holders.

The results indicate that the number of literate people is quite high in the Koliwada. Only 4 respondents were illiterate, they were old people, above the age of 60. According to the above results, majority of the respondents had completed their graduation, which shows the educational progress of the residents of the Koliwada. Some of them even had post-graduation and even Ph D degrees, which is exceptionally good. This shows that residents of Koliwada know and understand the importance of education which is vital for the development of the Koliwada in long run.

• **Religion:**

Respondents were asked about their religions. The data about religions has been analysed and presented in the table 4.2.5 and figure 4.6.

Table 4.2.5 Religion wise distribution of the respondents

Sr. No	Religion	Frequency
1	Hindu Koli	38
2	Christian Koli	25
3	Muslim	16
4	Buddhist	7
5	Others	14

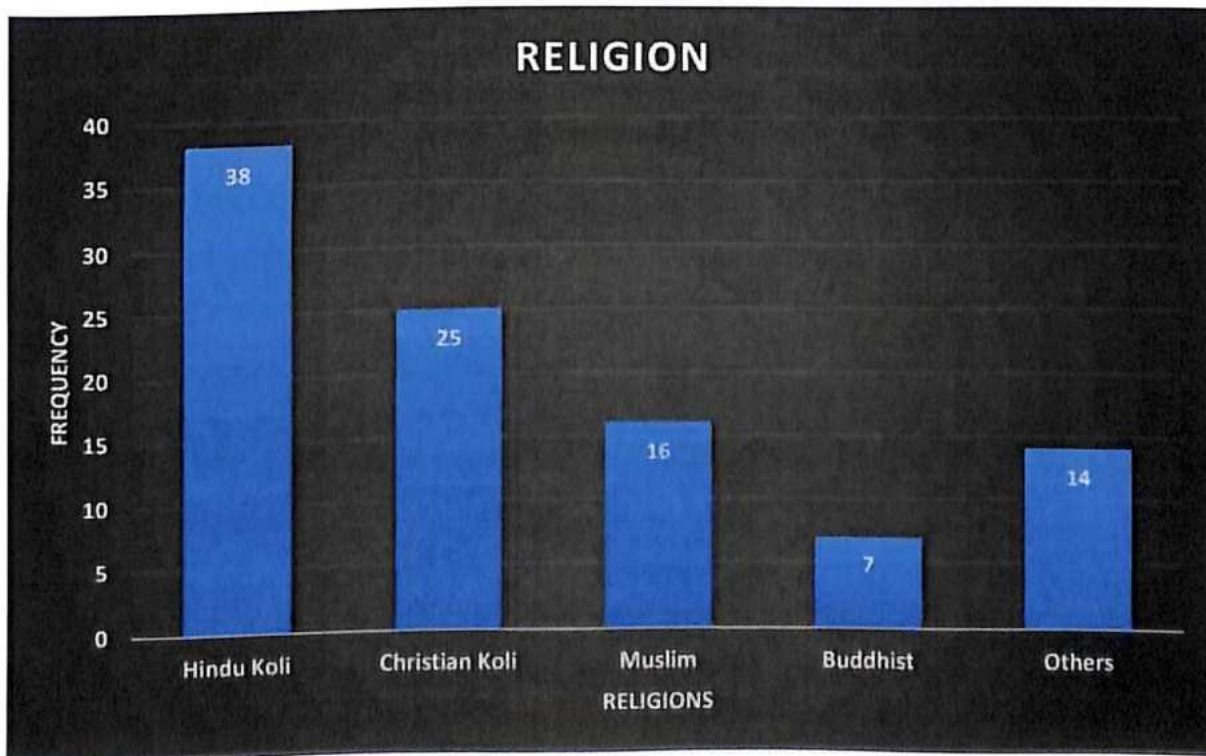


Figure 4.6 Graph representing the religion wise distribution of the respondents

Table 4.2.5 and figure 4.6 represent the religion wise distribution of respondents in the Worli Koliwada. From the above table and figure, it can be concluded that majority of residents of the Koliwada are Hindu Koli. Out of 100 respondents, 38 of them are Hindu Koli. It means that they follow Hinduism and their caste is Koli caste. Hindu Koli are primarily the indigenous fishing community of the Koliwada who are the native people of the area. They are primitive Marathi speaking clan.

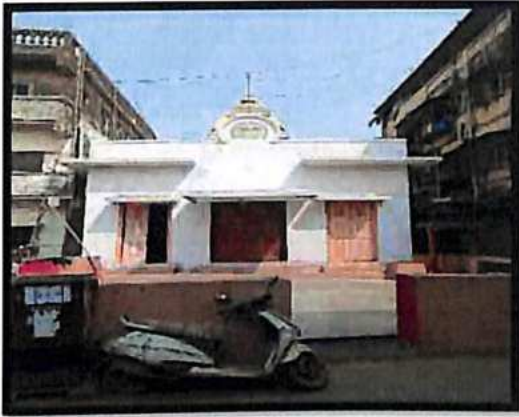


Figure 4.7 Hanuman Mandir of Worli Koliwada

(Important religious place of Hindu Koli)

The second largest religious group is of Christian Koli. Out of 100 respondents, 25 of them are Christian Koli. These people follow Christianity and practice the traditions and rituals of Christianity. They worship Mother Mary and Jesus Christ. They are Catholic Koli. They are also primarily involved in fishing.



Figure 4.8 Our Lady of Velenkanni Cross of Worli Koliwada

(Important religious place of Catholic Koli)

Third major religious group in the Koliwada is of Muslim community, 16 respondents were Muslim. It is a nontheistic religion which is generally followed by the migrants who have migrated from other regions to the Koliwada due to various reasons.

Out of 100 respondents, 7 were Buddhist. Small population of Buddhist people is also seen in the Worli Koliwada. However, the number of Buddhist people is quite less. They are also migrants. Some of them got converted to Buddhist.

Then, 14 respondents belonged to other religions and castes, there is very low population of people belonging to various other religious groups including Sikh and Parsi people. Hindu (non Koli) community is also seen in the Worli Koliwada.

- **Status of ownership of your house:**

Respondents were asked about their status of ownership of house. This data has been analysed and represented in the table 4.2.6 and figure 4.9.

Table 4.2.6 Status of ownership of houses of respondents

Sr. No.	Status of ownership of house	Frequency
1	Rented	85
2	Owned	13
3	Both	2

STATUS OF OWNERSHIP OF HOUSE

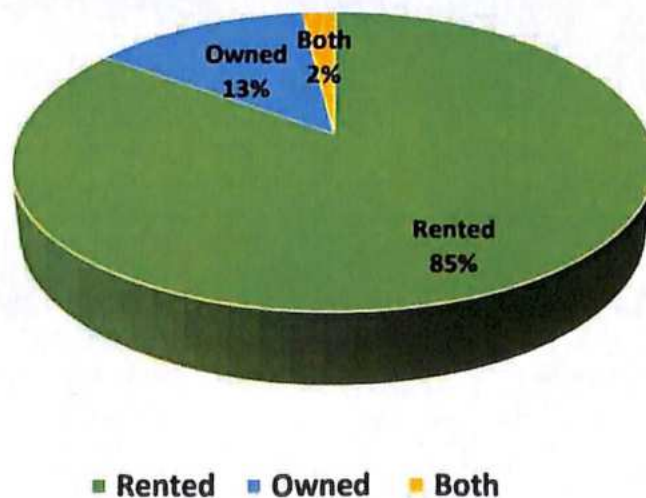


Figure 4.9 Graph representing the status of ownership of houses of respondents

Table 4.2.6 and figure 4.9 represent the status of ownership of house of respondents of the survey. From the above table and figure, it can be concluded that the majority of the respondents (85 respondents) live in rented houses and only a few (13 respondents) live in their own houses. Minimal number i.e., only 2 out of 100 respondents have both owned as well as rented houses.



Figure 4.10 House of landlord in the Worli Koliwada



Figure 4.11 House of tenants (under Pagdi System) in the Worli Koliwada

During the survey, it was found out that Pagdi system is still practised in the Worli Koliwada. In simple words, Pagdi system is a system in a person lives in house on rental basis and pays minimal rent. The rent is negligible under Pagdi system. The person can live in that house for as many years as he desires by paying rent to the landlord, however he cannot buy that house. The person living on rental basis cannot even do any construction in the house.

During the survey, one of the respondents said that he lives in house under Pagdi system and has to pay only rupees 100 as monthly rent of the house. This amount is nil in front of rents of houses in Mumbai. However, this system still prevails in the Koliwada. This is one of the major reasons of migration of people from other areas to this region.

- **Is fishing your traditional economic activity?**

Respondents were asked if fishing is their traditional economic activity or not. The data about fishing being traditional economic occupation has been analysed and presented in the table 4.2.7 and figure 4.12.

Table 4.1.7 Respondents having fishing as their traditional economic activity

Sr. No	Responses	Frequency
1	Yes	77
2	No	23

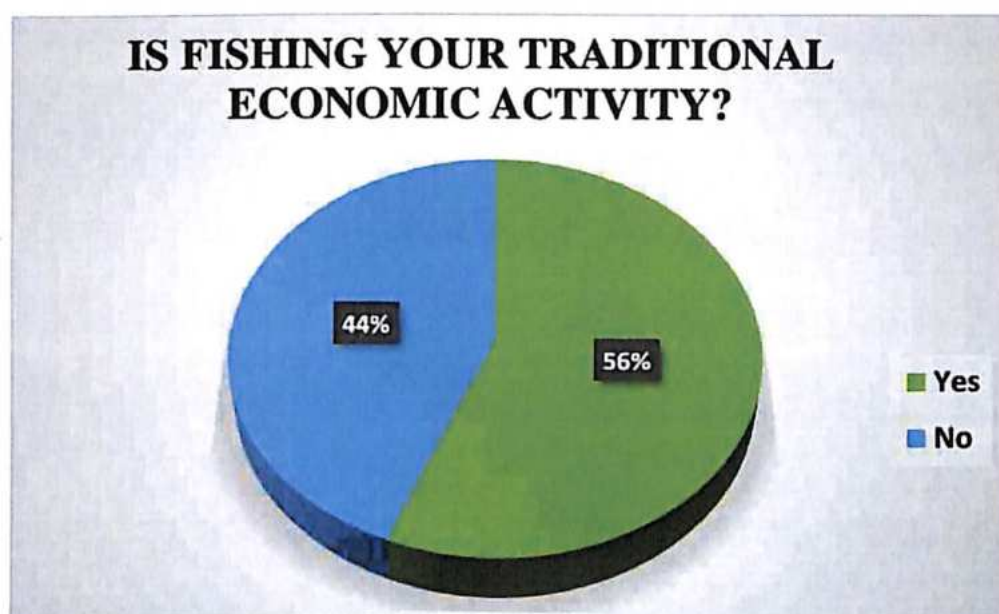


Figure 4.12 Graph representing respondents having fishing as their traditional economic activity

Table 4.2.7 and figure 4.12 show the proportion of people in the Koliwada having fishing as their traditional economic activity. As it is already seen in the table and figure that the majority of people in the Koliwada are Koli (both Hindu Koli and Christian Koli), they are original fishermen of the village. They have been engaged in this fishing business since ages and pass on their traditional fishing skills and methods from one generation to another.

From the above table and figure, it can be seen that 77 out of 100 respondents i.e., 56 % respondents have fishing as their traditional economic activity. Thus, it may be concluded that these respondents are either Hindu Koli or Christian Koli.

Then, 23 (44%) out of 100 respondents said that fishing is not their traditional economic activity. These respondents may be the migrants (non – fishing community).

- **Is fishing your main economic activity currently?**

Respondents were asked if fishing is their main economic activity currently or not. The data is analysed and represented in the table 4.2.8 and figure 4.13.

Table 4.2.8 Respondents having fishing as their main economic activity

Sr. No	Responses	Frequency
1	Yes	56
2	No	44

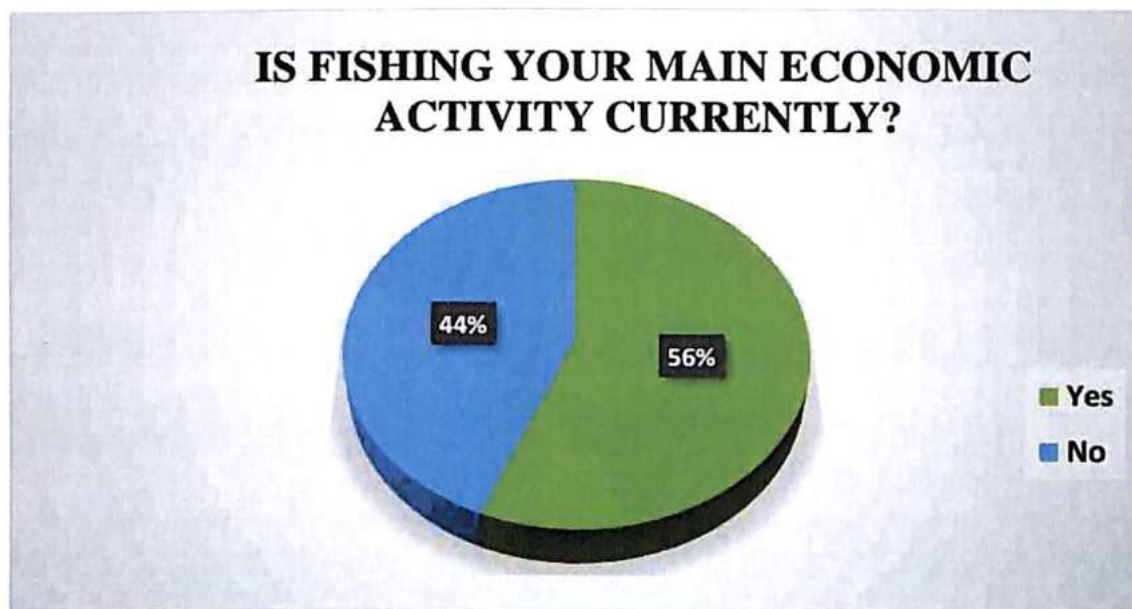


Figure 4.13 Graph representing respondents having fishing as their main economic activity

Table 4.2.8 and figure 4.13 represent the number of people having fishing as their main economic activity currently. Only 56 (56%) out of 100 respondents are engaged in fishing as their primary or main occupation. In the previous question, it was seen that, 77 out of 100 respondents said that fishing is their traditional economic activity. However, only 56 out of those 77 still practice fishing as their main economic activity.

With changing times, the choices of people have also changed. Koli people have also adopted some changes in their lifestyle and also in their occupation. Earlier, fishing was done to fulfil household needs and also to earn money but as Koli people became more educated, skilled, attained professional training in various fields, they changed their occupation as per their choices.

There are various other reasons as well, which led to shift from traditional economic activity (fishing) to other economic activities.

Then, 44 (44%) out of 100 respondents said that fishing isn't their main economic activity. These may be migrants or even Kolis who have shifted to other occupations.

- **Where do you fish? (Location of the Fishing Sites)**

Respondents were asked about their fishing sites. The data about fishing sites has been analysed and presented in the table 4.2.9 and figure 4.14.

Table 4.2.9 Fishing sites preferred by respondents

Sr. No	Fishing sites	Frequency
1	Worli	59
2	Madh	30
3	Versova	33
4	Gorai	11
5	Colaba	33
6	Others	24

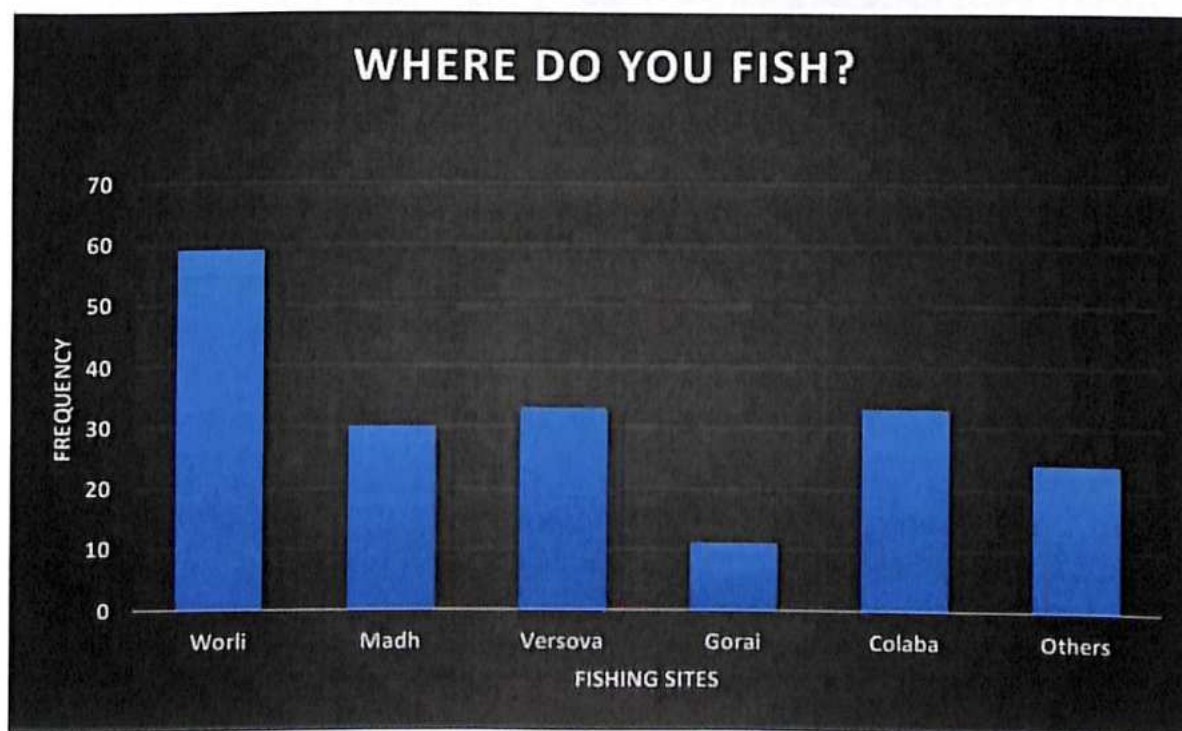


Figure 4.14 Graph representing various fishing sites preferred by respondents

Table 4.2.9 and figure 4.14 represent various sites where fishing is done by the respondents who are still engaged in fishing as their main economic activity. It can be seen that the majority of the respondents (59) catch fishes in Worli itself. However, a fisherman who does fishing in Worli may also fish in other places. Majority of respondents chose more than 1 option.

Versova is the second most preferred fishing site by the residents of the Koliwada. 33 respondents said that they go travel up to Versova to catch fishes. Versova is located in Andheri.

30 respondents said that they travel up to Madh, Malad to do fishing. Madh is also a good fishing ground. Followed by Colaba and other areas. Other areas include Palghar Raigad Ratnagiri, Sindhudurg, Goa, Gujarat etc. These fishermen are confined to any specific locations, they travel as per their choices wherever they think to have more some number of fishes.

• **How many members of your family are engaged in fishing?**

Respondents were asked about the distance travelled by them for fishing. The data has been analysed and presented in the table 4.2.10 and figure 4.15.

Table 4.2.10 Number of family members of respondents who are engaged in fishing

Sr. No.	Members involved in fishing	Frequency
1	All	20
2	Only me	40
3	All males	23
4	None	17

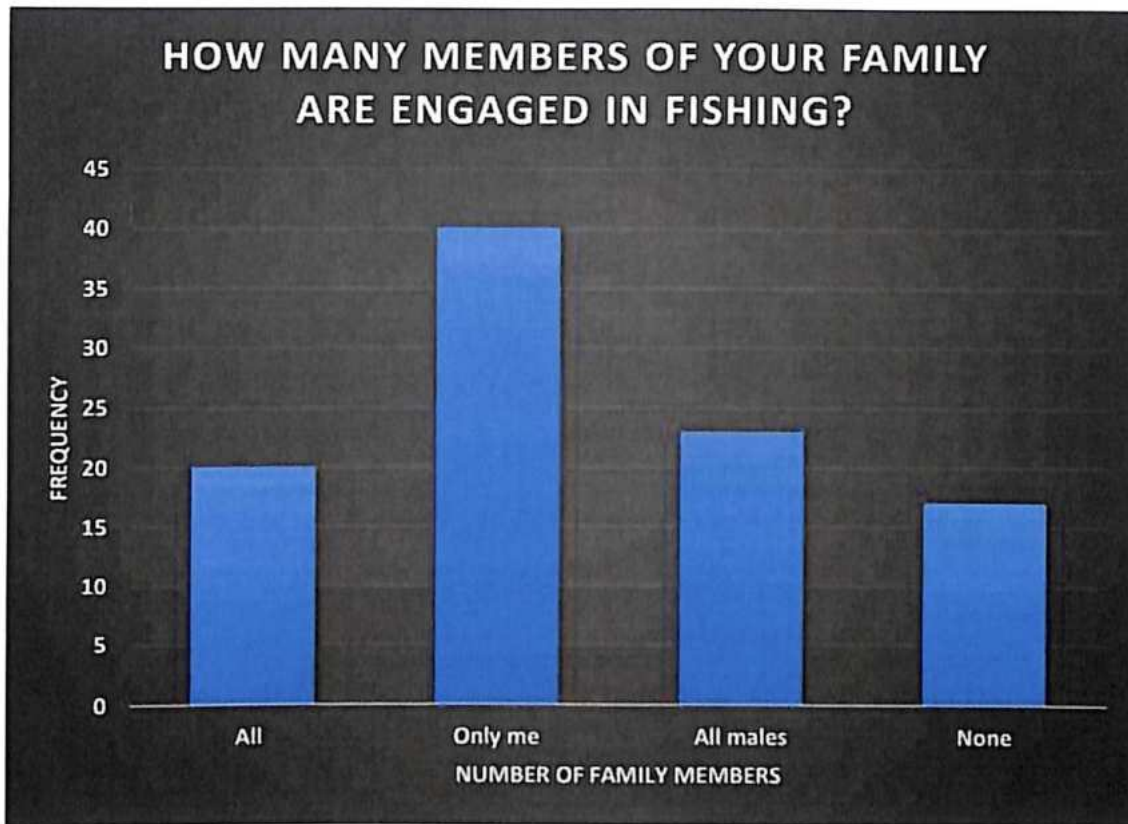


Figure 4.15 Graph representing the number of family members of respondents who are engaged in fishing

Table 4.2.10 and figure 4.15 represent the number of family members of survey's respondents who are engaged in fishing.

20 respondents said that all the members of their families are involved in fishing but majority of the respondents i.e., 40 of them said that no one from their families except them is involved in fishing.

23 respondents said that only male members of their families are involved in this practice. Traditionally, catching fish is the main task of men and selling those fishes in the fish market is the primary occupation of women. However, this traditional approach is changing with changing times but the rate of change is very slow. Still, today majority of fishing is done by men and selling them remains the chore of women.

17 respondents said that no one from their family is involved in fishing. These are primarily those people who are non Koli, basically migrants to the Koliwada.

• **If fishing is your main economic activity, for how many years have you been engaged in this occupation?**

Respondents were asked whether if fishing is their main economic activity currently then for how many years have, they been engaged in this activity. The data about the time is analysed and presented in table 4.2.11 and figure 4.16.

Table 4.2.11 Time duration of respondents involved in fishing

Sr. No	Years	Frequency
1	Less than 5 years	4
2	5 to 10 years	6
3	10 to 20 years	12
4	20 to 40 years	14
5	More than 40 years	20



Figure 4.16 Graph representing the time duration of respondents involved in fishing

Table 4.2.11 and figure 4.16 show the time duration of people involved in this activity. Majority of respondents i.e., 20 respondents were engaged in this activity for more than 40 years. These are older people (in the age group (above 60)). They have done this activity since their youth hence now they have good experience of fishing.

Then 14 respondents were engaged in fishing for around 20 to 40 years, which is also quite long span to be in an occupation. Only 4 respondents said that they were involved in this business since less than five years.

- **Are you engaged in any other occupation other than fishing or is any other activity other than fishing your main source of income?**

Respondents were asked about being involved in any other occupation other than fishing and what is that occupation. The data about involvement in other occupations has been analysed and presented in the table 4.2.12 and figure 4.17.

Table 4.2.12 Respondents involved in other occupations other than fishing

Sr. No	Responses	Frequency
1	Yes	45
2	No	55

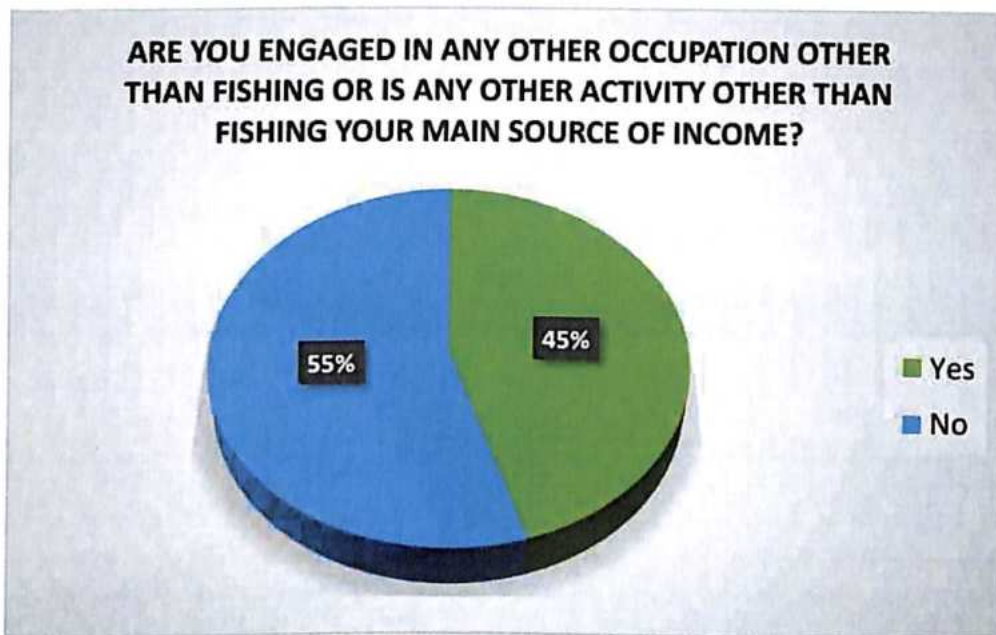


Figure 4.17 Graph representing the number of respondents involved in other occupations other than fishing

Table 4.2.12 and figure 4.17 indicate the number of people who are engaged in any other occupation other than fishing. From the above table and figure, it can be seen that less than half of the respondents are engaged in any other occupation other than fishing.

45 out of 100 respondents are engaged in some other economic activities while the remaining 55 respondents are still engaged in fishing. In simple words, it can be concluded that fishing is the main economic activity of 55 respondents.

If yes, which activity do you practice other than fishing or what is your main source of income (if you don't fish)?

The respondents who were engaged in occupations other than fishing, were asked to name that occupation. The data about various occupations has been analysed and presented in the table 4.2.13 and figure 4.18.

Table 4.2.13 Main economic activities of the non-fishermen respondents

Sr. No.	Main economic activities / occupation	Frequency
1	Dairy Farming	5
2	Laundry	1
3	Carpentry	5
4	Selling fruits and vegetables	8
5	Mobile repairing	3
6	Teaching	7
7	Plumber	2
8	Mechanic	10
9	Government employee	3
10	Engineer	4
12	Construction worker	11

IF YES, WHICH ACTIVITY DO YOU PRACTICE OTHER THAN FISHING OR WHAT IS YOUR MAIN SOURCE OF INCOME (IF YOU DON'T FISH)?



Figure 4.18 Graph representing the main economic activities of the non-fishermen respondents

Table 4.2.13 and figure 4.18 represent the main economic activities of the non-fishermen. From the above table and figure, it can be concluded that the majority of the respondents who are non- fishermen are construction worker. The construction workers are 11 in number.

Construction workers are followed by the mechanics, 10 respondents were mechanics, followed by fruits and vegetable vendors who are 8 in number, then 7 respondents were involved in teaching profession, followed by 5 respondents being engaged in carpentry, 5 respondents were also involved in the business of dairy farming, 4 respondents were engineers, 3 of them were involved in mobile repairing and 3 respondents were also government employees. Two respondents were plumbers and only one respondent was involved in laundry business

If involved in fishing, do you own and use your own boat?

The respondents were asked about their ownership of boats. The data has been analysed and presented in the table 4.2.14 and figure 4.19.

Table 4.2.14 The number of respondents owning their own boats

Sr. No	Responses	Frequency
1	Yes	34
2	No	22

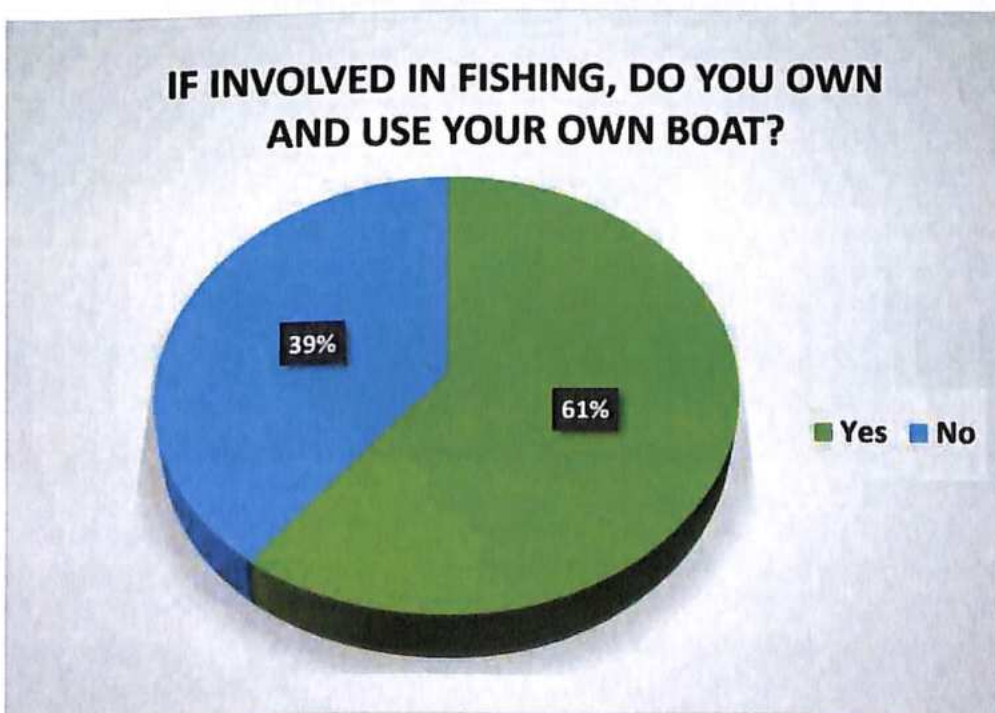


Figure 4.19 Graph representing the number of respondents owning their own boats

Table 4.2.14 and figure 4.19 represent the number of respondents owning their own boats. From the above table and figure, it can be seen that only 34 respondents out of 56 respondents have their owned boats which they use for fishing while others (22 out of 56 respondents) are engaged in fishing but they don't own a boat. They use others boats may be on rent. Some people go for fishing with others on their boats itself.

If yes, what kind of boat do you own?

The respondents were asked about the type of boats owned by them, whether it is traditional or mechanised or do they own both the types of boats. The data about the types of boats owned by the respondents has been analysed and presented in the table 4.2.15 and figure 4.20.

Table 4.2.15 Different types of boats owned by fishermen

Sr. No.	Type of boat	Frequency
1	Traditional	35
2	Mechanised	15
3	Both	12

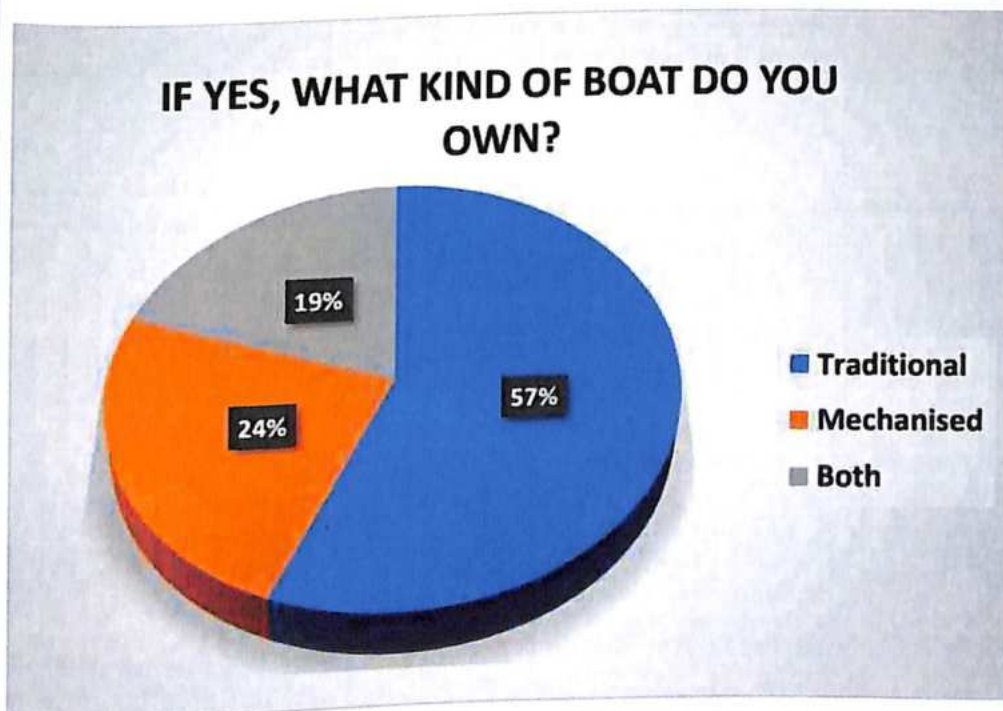


Figure 4.20 Graph representing different types of boats owned by fishermen

Table 4.2.15 and figure 4.20 indicate the different types of boats owned by fishermen in the Worli Koliwada. The above table and figure indicate that the majority of the fishermen in the

Worli Koliwada still own traditional boats. 35 out of 62 respondents own only traditional boats while only a few, 15 out of 62 respondents own mechanised boats. While other 12 respondents own both traditional and mechanised boats.



Figure 4.21 Different boats in the Worli Koliwada

How far from the shore do you go for fishing?

The respondents were asked about the distance travelled by them for fishing i.e., how far do they generally go for fishing. The data about the distance covered for fishing has been analysed and presented in the table 4.2.16 and figure 4.22.

Table 4.2.16 The distance travelled by the respondents for fishing

Sr. No.	Distance/ possibilities	Frequency
1	Less than 2 miles	13
2	2 to 4 miles	2
3	4 to 6 miles	4
4	More than 8 miles	7
5	Depends on situation and season	34

HOW FAR FROM THE SHORE DO YOU GO FOR FISHING?

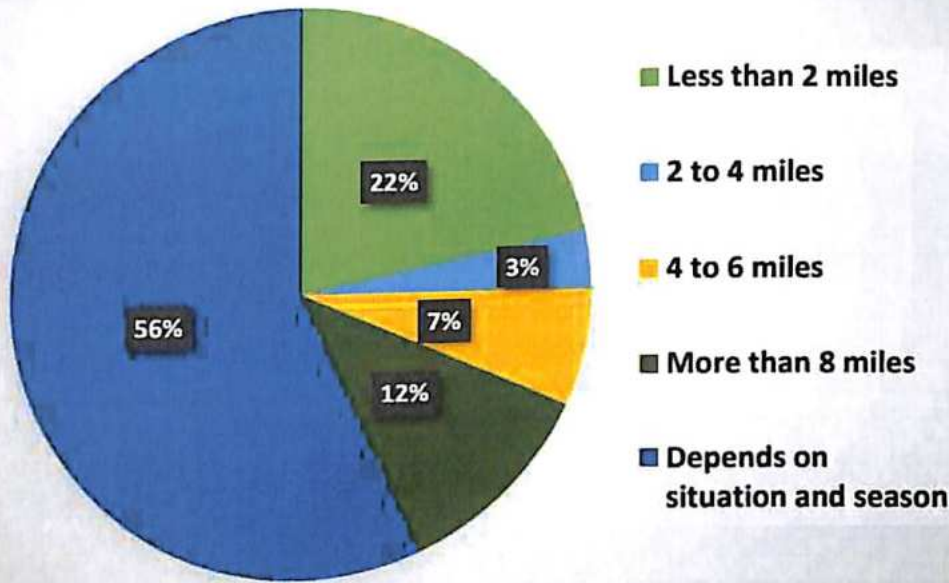


Figure 4.22 Graph representing the distance travelled by the respondents for fishing

Table 4.2.16 and figure 4.22 represent the distance travelled by the respondents for fishing. The above table and figure indicate that the majority of the respondents have not decided any fixed area for fishing. 34 respondents said that the distance travelled for fishing depends on situation and season of the year. During survey, it was found that maximum fishing is done in the summer season as during summer season fish catch is good. Larger number of fishes come to the surface in summer month starting from April to June. While in the raining season, due to heavy showers and fierce winds which increase the chances of turning the boats and other accidents, hence government does not allow fishermen to fish during raining season and again in winter season lesser number of fishes come to the surface, hence the fish catch reduces in winter. So, depending on the season and the weather phenomenon, majority of respondents travel to different sites for fishing.

7 respondents travel more than 8 miles, 4 travel between 4 to 6 miles and 13 travel only for a short distance i.e., less than 2 miles. It means that the fish only in Worli and adjoining areas. It may be because fishing isn't their main economic activity. It just does it as a side business or a leisure activity on weekends maybe.

What kinds of equipment do you have in your boat?

The respondents were asked about the types of equipments they have in their boats. The data about various types of equipments used by respondents in boats is analysed and presented in the table 4.2.17 and figure 4.23.

Table 4.2.17 Different kinds of instruments and equipments used by respondents in their boats

Sr. No.	Types of Equipment	Frequency
1	GPS	51
2	Sound signalling devices	5
3	Deck light for night fishing	13
4	Life jackets	51
5	No equipment	18

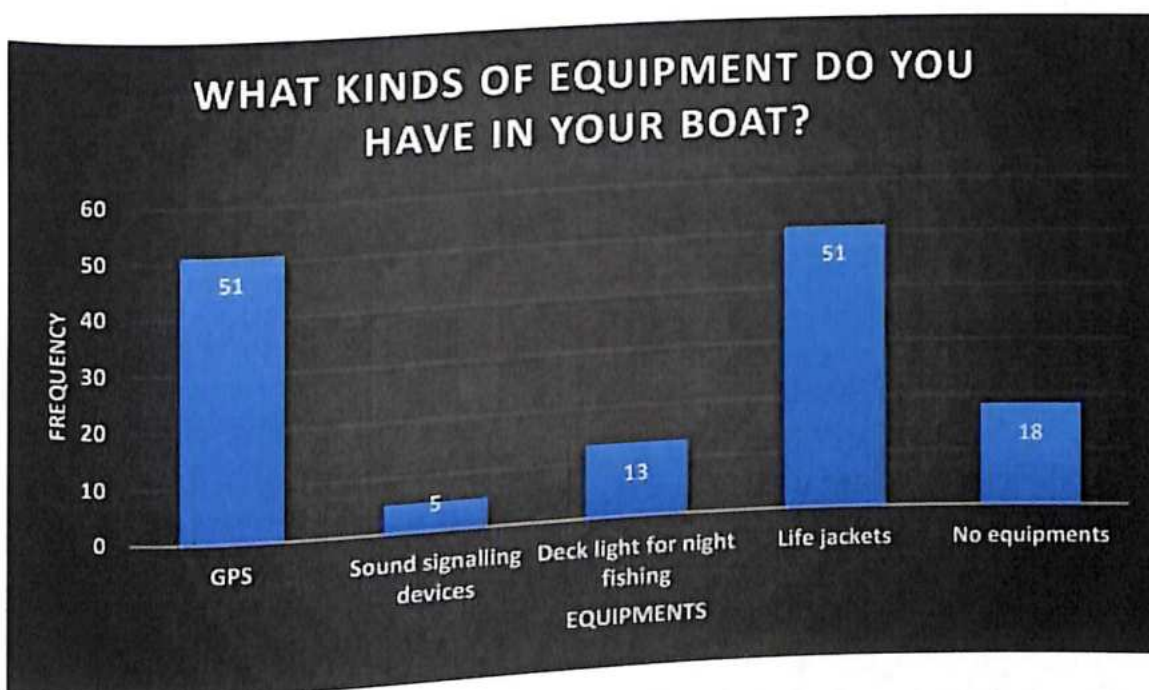


Figure 4.23 Graph representing the different kinds of instruments and equipments used by respondents in their boats

Table 4.2.17 and figure 4.23 indicate different kinds of instruments and equipments used by respondents in their boats. From the above table and figure, it can be seen that majority of the respondents have Global Positioning device (GPS) and Life jackets in their boats. These two equipments/ objects are vital for any fisherman to fish safely. Absence of GPS can lead to misleading of the path which may lead the fishermen in wrong direction. Secondly, life jackets are vital for the safety of people on the boat. They place crucial role in saving lives in case of any mishap or accident. Hence, majority of respondents have these two crucial devices/ objects.

Then, apart from these two things, 13 fishermen also have deck light for night fishing. It is highly useful for fishermen who travel long distances for fishing.

Only 5 respondents have sound signalling devices on their boats and 18 respondents didn't have any device on other boats. They may be the fishermen having traditional boats without any kind of machines in them.

• **Are you willing to adapt new ideas and technological changes in fishing?**

Respondents were asked about their willingness to adopt new ideas and technological changes in fishing. The data about both the willingness and denial of respondents to adopt new ideas and any technological changes in the field of fishing has been analysed and presented in the table 4.2.18 and the figure 4.24.

Table 4.2.18 Willingness and unwillingness of respondents to adopt new ideas and technology

Sr. No.	Options	Frequency
1	Yes	33
2	No	23
3	May be	2

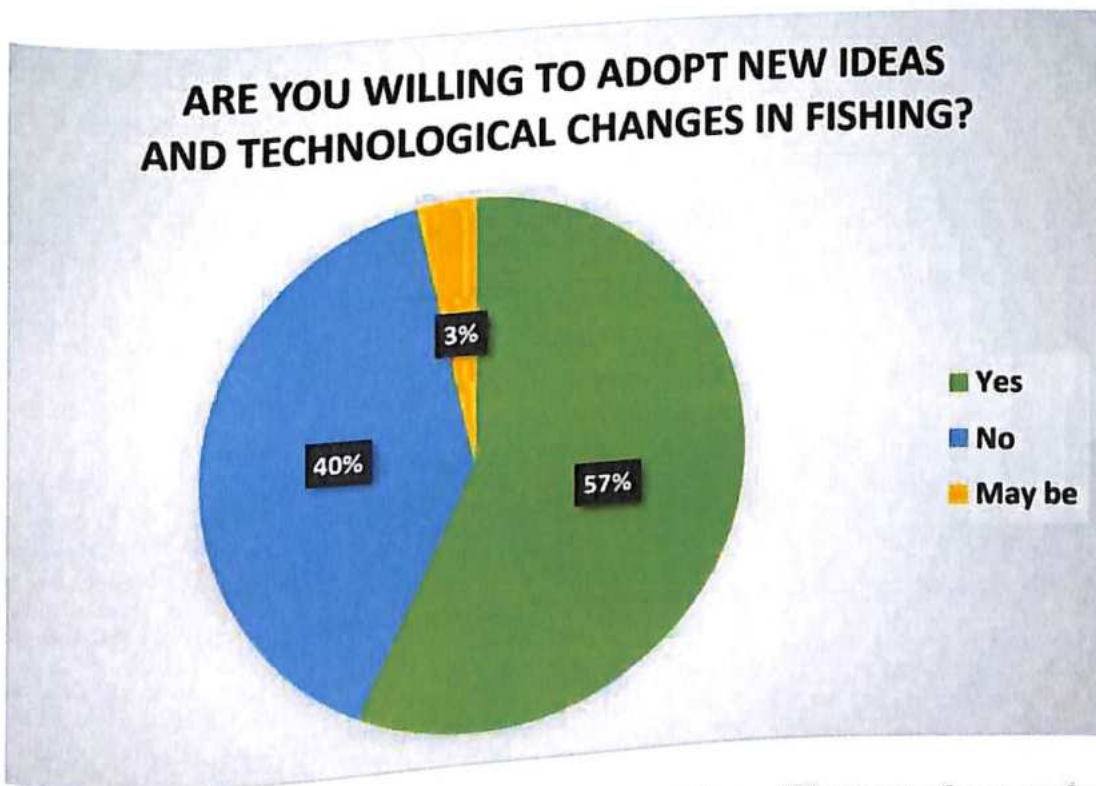


Figure 4.24 Graph representing willingness and unwillingness of respondents to adopt new ideas and technology

Table 4.2.18 and figure 4.24 indicate that the number of respondents who are willing and also those who are unwilling to adopt new ideas and technologies in fishing. Majority of fishermen are willing to adopt new ideas and technology in fishing. These are basically those fishermen who have their own boats, mainly mechanised boats. They are mostly educated and have some technological knowledge and are also visionary. The most important aspect is being economically sound, only if they have money, they can invest in newer technology, devices and machines. If they don't have enough money for adopting newer technology, then even if they are wiliness to adopt newer technology won't work.

23 respondents were unwilling to adopt new technologies in fishing. The reasons vary from person to person, some may be uneducated and technologically backward. Some may be financially incapable to adopt new technologies.

Some of the fishermen (2) were unsure what to reply.

• **Are you suffering from any lifestyle disease especially because of fishing?**

Respondents were asked about being suffering from any lifestyle disease especially because of fishing. The data about occurrence of lifestyle disease is analysed and presented in the table 4.2.19 and figure 4.25.

Table 4.2.19 The prevalence of any lifestyle or health issue because of fishing

Sr. No	Options	Frequency
1	Yes	0
2	No	53

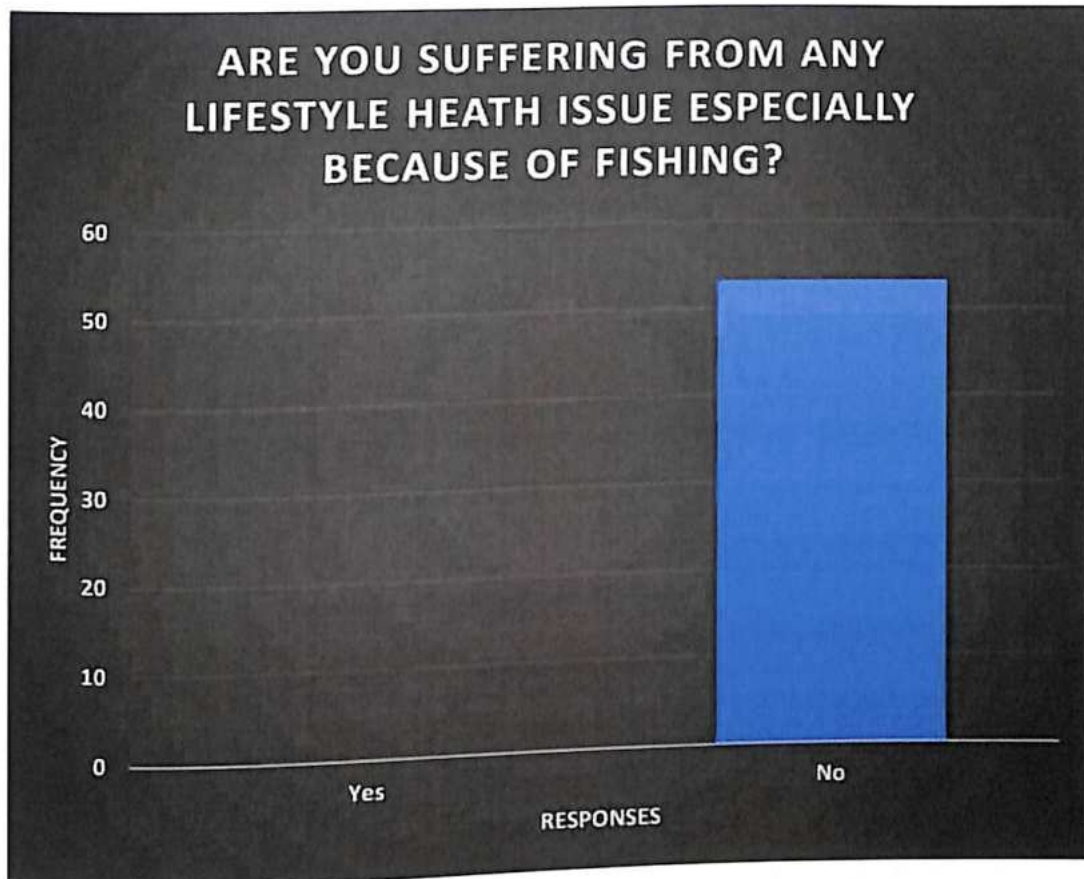


Figure 4.25 Graph representing the prevalence of any lifestyle or health issue because of fishing

Table 4.2.19 and figure 4.25 represent the prevalence of any lifestyle or health issue because of fishing. All the respondents involved in fishing denied prevalence of any lifestyle issue especially because of fishing. Sometimes, they get hurt, have minor cuts on hands and other body parts while pulling nets etc but they don't suffer from any lifestyle issue because of fishing.

Do you face any danger while fishing?

Respondents were asked if they face any danger while fishing. The data about occurrence of danger while fishing has been analysed and presented in the table 4.2.20 and figure 4.26.

Table 4.2.20 Occurrence of danger while fishing

Sr. No.	Options	Frequency
1	Yes	45
2	No	5
3	Sometimes	16

DO YOU FACE ANY DANGER WHILE FISHING?

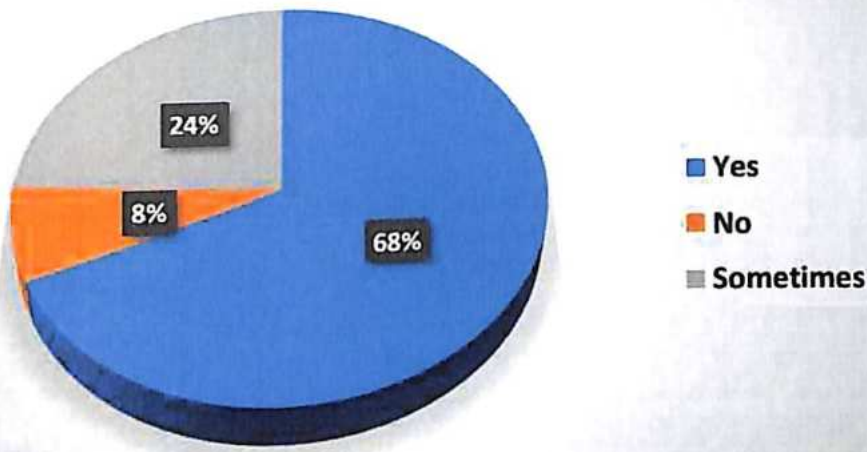


Figure 4.26 Graph representing the occurrence of danger while fishing

Table 4.2.20 and figure 4.26 indicate the occurrence of danger while fishing. From the above table and figure, it can be seen that the majority of fishermen face danger while fishing. 45 respondents (68%) have said yes while only 5 (8%) of them have said no, while remaining fishermen (16 respondents i.e., 24 %) face danger only sometimes. It means fishing is a risky and sometimes even life-threatening activity.

If yes, what kind of dangers do you face?

Respondents were asked about the kind of dangers they face while fishing. The data about the different kinds of dangers faced by the fishermen while fishing has been analysed and presented in the table 4.2.21 and figure 4.27.

Table 4.2.21 Types of dangers encountered by respondents while fishing

Sr. No	Types of dangers while fishing	Frequency
1	Storm and cyclones	31
2	High Speed winds	2
3	Bad weather	14
4	Heavy rainfall	5
5	Big stones	3
6	Violent waves	14

IF YES, WHAT KIND OF DANGERS DO YOU FACE?

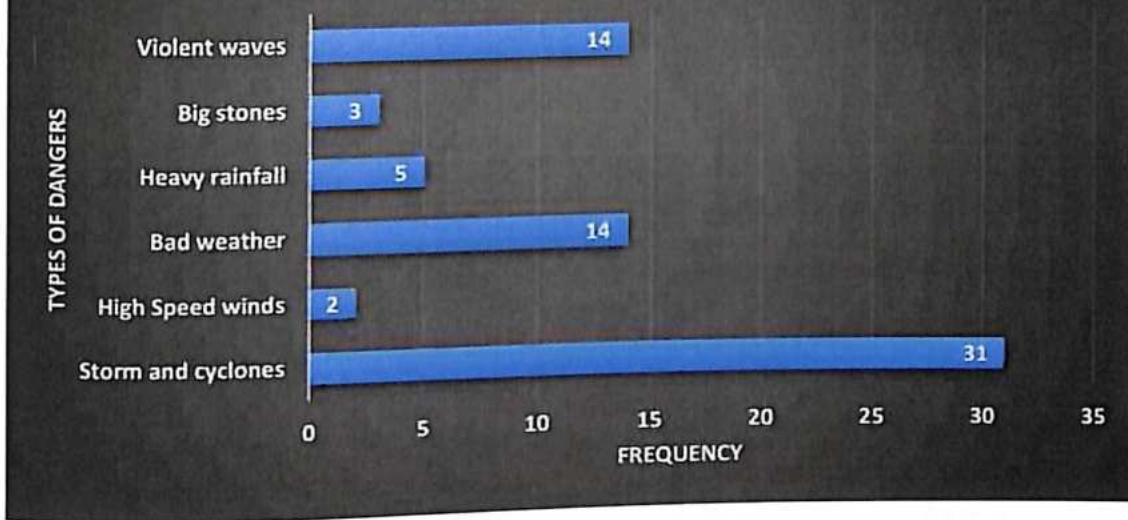


Figure 4.27 Graph representing the types of dangers encountered by respondents while fishing

Table 4.2.21 and figure 4.27 indicate the types of dangers encountered by respondents while fishing. Most of them are related to day-to-day weather phenomena. 31 respondents said storms and cyclones are the most dangerous aspects while fishing, followed by bad weather according to 14 respondents, other 1 respondent believe violent waves as main danger while fishing, followed by heavy rainfall as per 5 respondents. 3 respondents fear the presence of big stones which may obstruct the path and cause harm to boats if hit. Only 2 respondents talked about high-speed winds.

The above responses indicate that fishing is not at all easy and safe activity. It requires a lot of safety, courage, alertness and strength. Bad weather includes all the above dangers. Government suggests fishermen not to fish in rainy season and other day having bad weather (cyclones, storms, high speed winds etc) but still some poor and small fishermen sail out to earn their living.

What is your monthly income from fishing?

Respondents were asked about their monthly income from fishing. The data about their monthly fishing income is analysed and presented in the table 4.2.22 and figure 4.28.

Table 4.2.22 Monthly income of respondents involved in fishing

Sr. No	Income groups	Frequency
1	Less than 10000	4

2	10000 to 20000	6
3	20000 to 40000	5
4	More than 40000	3
5	Depends on fish catch and market prices	13
6	Not fixed, varies from month to month	23



Figure 4.28 Graph representing the monthly income of respondents involved in fishing

Table 4.2.22 and figure 4.28 represent the monthly income of respondents involved in fishing. From the above table and figure, it may can be seen that income of majority of respondents (23 respondents) isn't fixed. It varies from month to month (season to season). 13 respondents said that their monthly income depend on fish catch and market prices. If the fish catch is good and the prices are high in the market, they their income is also high and vice versa.

6 respondents have monthly income between 10000 to 20000, 5 of them have monthly income between 20000 to 40000 indicating well to do fishermen.

Only 4 of the total respondents stated their monthly income to be less than 10000.

They are generally small fishermen who don't have their own boats and may also be technologically backward.

- Over the last 5 years, how has your income from fishing changed?

The respondents were asked about the change in their income over the period of last 5 years. The data about the change in income has been analysed and presented in the table 4.2.23 and figure 4.29.

Table 4.2.23 The change in income of fishermen over the last five years

Sr. No	Changes in income	Frequency
1	Increased	0
2	Deceased	45
3	Stable	5
4	Varies from year to year	6

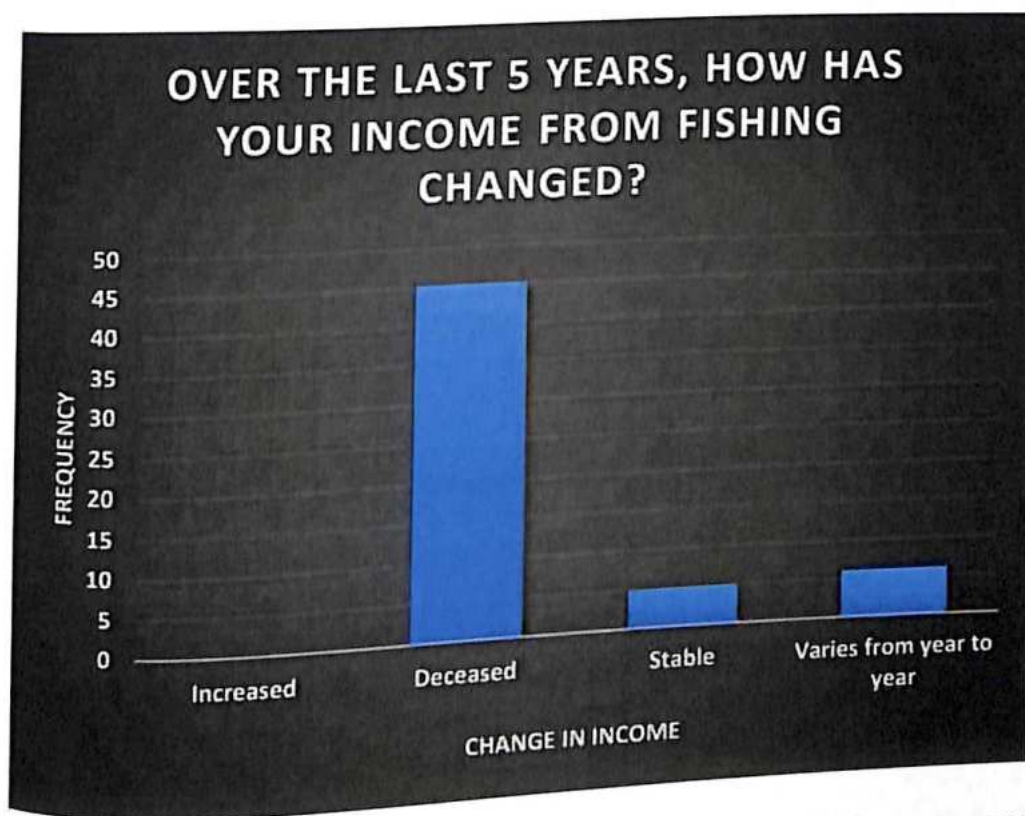


Figure 4.29 Graph representing the change in income of fishermen over the last five years

Table 4.2.23 and figure 4.29 represent the change in income of fishermen over the last five years. Majority of fishermen (45 respondents) stated their income to have decreased over the period of last five years. None of the respondents said that their income increased over the last 5 years. 16 of them stated it to be varying from year to year. Only 5 respondents said that their income is stable.

- Please state the reason for the change in income over past the five years.

The respondents were asked about the reasons which led to change in their income over the past five years. The data about the reasons has been analysed and presented in the table 4.2.24 and figure 4.30.

Table 4.2.24 The major reasons for change in income of fishermen over the last five years

Sr. No.	Reason for change in income	Frequency
1	Lockdown	52
2	Pandemic	52
3	Coastal Projects in Mumbai	56
4	Changes in prices of fish and fishing related equipments	30



Figure 4.30 Graph representing the major reasons for change in income of fishermen over the last five years

Table 4.2.24 and figure 4.30 represent the major reasons for change in income i.e., decrease in income over the period of five years. The first and foremost reason of decrease in income according to 52 respondents is lockdown which was implemented by the Government during

2020 and also in 2021, because of lockdown they were forced be at homes leading to loss of livelihood. They also believe pandemic to be responsible for their decreased in income.

Then, 56 respondents said that along with pandemic and lockdown, coastal projects in Mumbai also affect their fishing patterns. Because of construction of coastal projects, for example, Bandra Worli sea link etc the fishing area has reduced. Secondly, the path for the movement of boats is also restricted because of big pillars built to support the bridge.

The smaller gaps between the pillars constraint the movement of big boats safely, also even if they pass easily on normal days, chances of accidents are high as sudden change in weather or sudden violent wind may hit the boat with the pillar, leading to mishap and immense damage to the boat.

• **Are you an immigrant to Worli Koliwada?**

The respondents were asked about their immigration to the Worli Koliwada i.e., if they are immigrants to the Worli Koliwada or not. The data about being immigrant is analysed and presented in the table 4.2.25 and figure 4.31.

Table 4.2.25 The number of immigrants and indigenious people

Sr. No	Options	Frequency
1	Yes	60
2	No	40



Figure 4.31 Graph representing the number of immigrants and indigenious people

Table 4.2.25 and figure 4.31 indicate the number of immigrants and also the number of indigenous people in the Worli Koliwada. According to the above table, 60 respondents were migrants and 40 of the them were indigenous people of the Koliwada.

• **If yes, why did you migrate to Worli Koliwada?**

The respondents who were immigrants were asked the reason for their migration to the Worli Koliwada. The data about the reasons for the respondents' migration has been analysed and presented in the table 4.2.26 and the figure 4.32.

Table 4.2.26 The reasons for migration to Worli Koliwada from other areas

Sr. No.	Reason of migration	Frequency
1	Cheaper housing	38
2	Better occupational opportunities	22

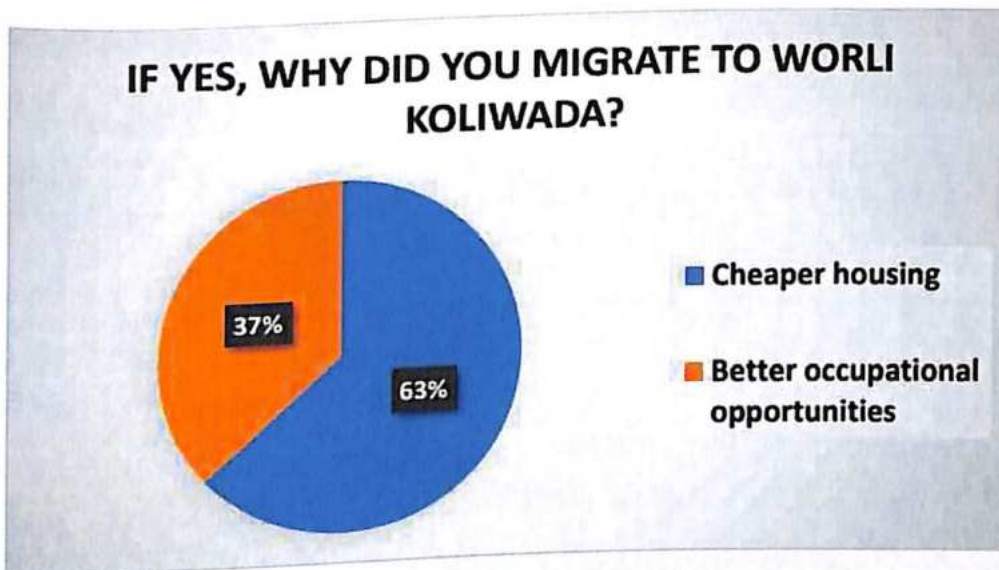


Figure 4.32 Graph representing the reasons for migration to Worli Koliwada from other areas

Table 4.2.26 and figure 4.32 represent the reasons for migration to Worli Koliwada from other areas. Majority of respondents (38) migrated to Worli Koliwada for cheaper housing available in the Koliwada.

Still Pagdi system is followed there, under which the tenant has to pay minimal rent of the house to the landlord and can live there safely with his family. This is the primary reason of migration of huge number of people from other areas to Koliwada.

Some people also migrated to Koliwada to have access to better occupational opportunities.

- **Do you have any problem with migrants settling in Worli Koliwada?**

The respondents were asked if they have any problem with migrants settling in the Worli Koliwada. Their responses have been analysed and presented in table 4.2.27 and figure 4.33.

Table 4.2.27 The occurrence of problems with migrants

Sr. No	Options	Frequency
1	Yes	58
2	No	22
3	Sometimes	20

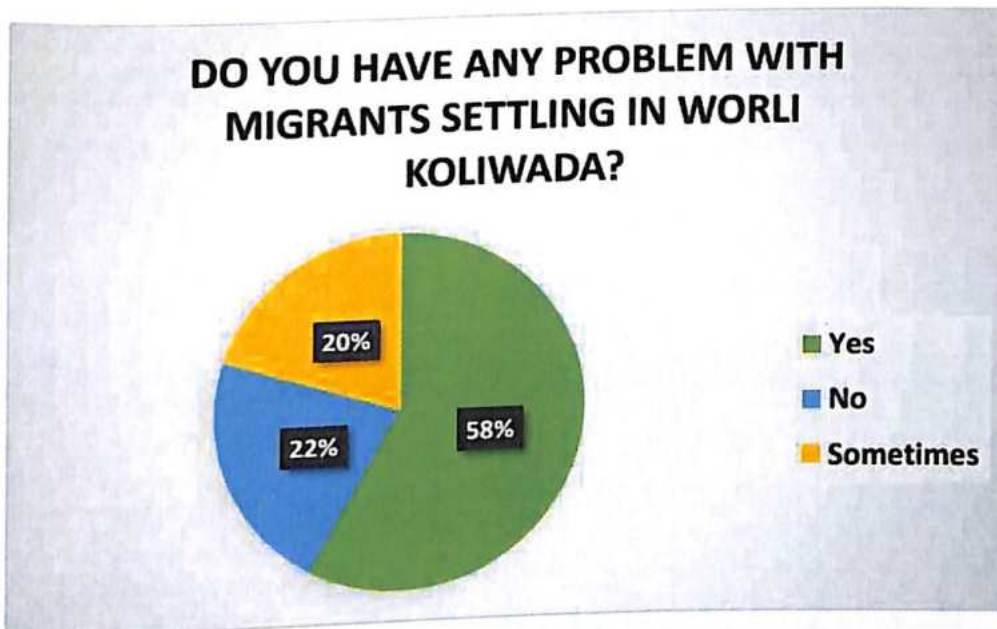


Figure 4.33 Graph representing the occurrence of problems with migrants

Table 4.2.27 and figure 4.33 indicate that occurrence of problems with migrants settling in the Koliwada. A majority of respondents have some problems with more and more respondents settling in the Koliwada. 20 respondents have issues only sometimes and not always while there are some respondents who don't have any issues or problems with settling of migrants in the Koliwada.

- **If yes, what kind of problem is it?**

The respondents who had problems with settling of more migrants in the Worli Koliwada were asked about the type of problem they have, what exactly is the problem they face due to immigration of migrants to the Koliwada. The data about kind of problems faced by the respondents due to settling of a greater number of migrants in the Koliwada has been analysed and presented in the table 4.2.28. and figure 4.34.

Table 4.2.28 Types of problems faced by the residents

Sr. No	Kinds of problems	Frequency
1	Congestion due to overcrowding	88
2	Lack of social space	3
3	Cultural conflict	4
4	Language conflict	5

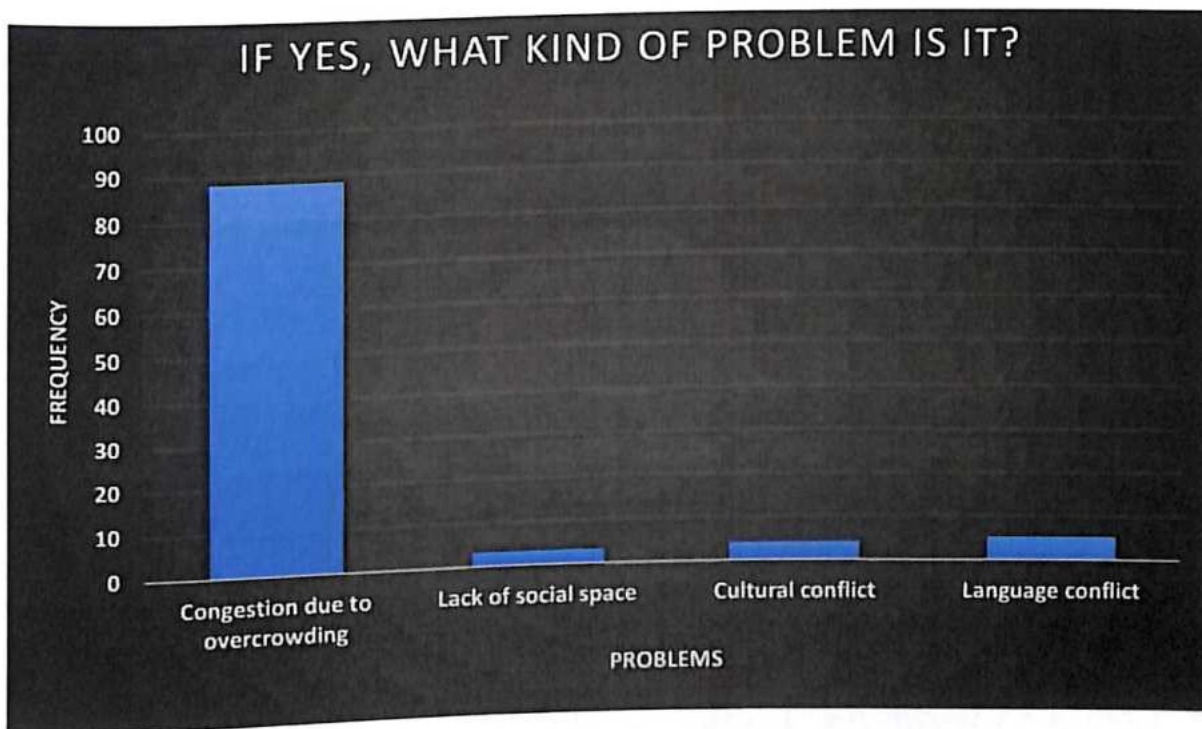


Figure 4.34 Graph representing the types of problems faced by the residents

Table 4.2.28 and figure 4.34 represent the types of problems faced by the residents of the Koliwada because of settling of migrants. the major problem is congestion due to overcrowding. As the space is limited in the Koliwada but the number of people living there is continuously increasing with influx of migrants leading to congestion and high population density which is quite disturbing to the residents. Minimal number of respondents face the issues of lack of social space, cultural conflict and language conflict.

Is Koli culture affected by the immigrants in any manner?

The respondents were asked if the Koli culture is affected by the settling of migrants in the Koliwada. Their responses have been analysed and presented in the table 4.2.29 and figure 4.35.

Table 4.2.29 State of changes in Koli culture because of immigrants

Sr. No	Options	Frequency
1	Yes	20
2	No	75
3	Somewhat	5

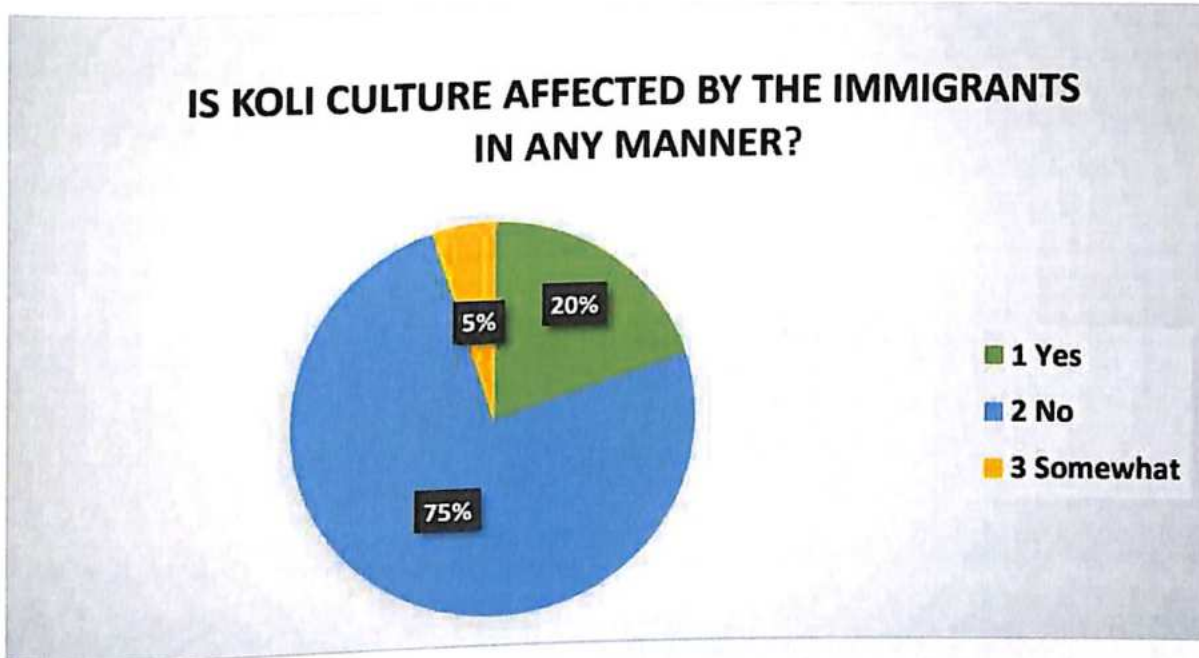


Figure 4.35 Graph representing the state of changes in Koli culture because of Immigrants

Table 4.2.29 and figure 4.35 represent the state of changes in Koli culture because of Immigrants. From the above table and figure, it can be seen that majority of respondents 75 out of 100 believe that Koli culture isn't affected by the migrants in any manner. While around 20 respondents believe that the original Koli culture is getting affected or changed while only a small no of respondents i.e., 5 of them believe that the Koli culture is getting changes somewhat but not exactly.

- **Do migrants adopt Koli culture in any manner?**

The respondents were asked about the changes in the Koli culture due to the influx of migrants in the Koliwada. The data about the changes in the Koli culture has been analysed and presented in the table 4.2.30 and figure 4.36.

Table 4.2.30 The state of acceptance of Koli culture by migrants

Sr. No	Options	Frequency
1	Yes	89
2	No	11

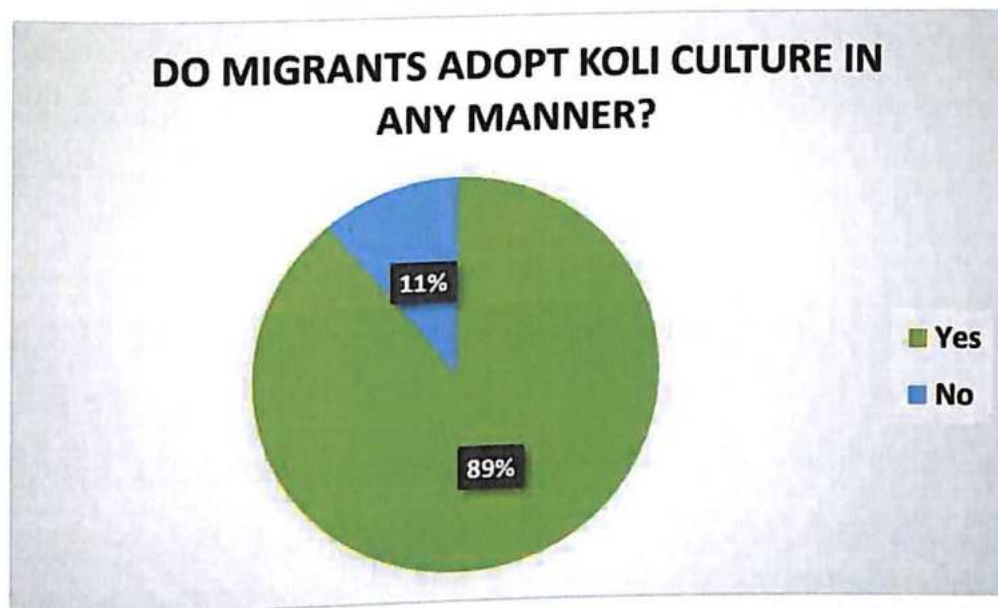


Figure 4.36 Graph representing the state of acceptance of Koli culture by migrants

Table 4.2.30 and figure 4.36 represent the state of acceptance of Koli culture by migrants in the Worli Koliwada. Around 89 % of the respondents believe that the migrants adopt Koli culture while the remaining respondents i.e., 11% don't have the same opinion.

• **Do migrants and indigenous people live peacefully and in a friendly manner in the Koliwada?**

The respondents were asked about the manner in which the Koli people and the indigenous people live together in the Worli Koliwada, whether they live in a friendly way or in an unfriendly way. The data about the manner in which the two groups of the Koliwada live together has been analysed and presented in the table 4.2.31 and figure 4.37.

Table 4.2.31 Manner in which migrants and indigenous Koli people live together

Sr. No	Options	Frequency
1	Yes	67
2	No	12
3	Not always but mostly	21

DO MIGRANTS AND INDIGENOUS PEOPLE LIVE PEACEFULLY AND IN A FRIENDLY MANNER IN THE KOLIWADA?

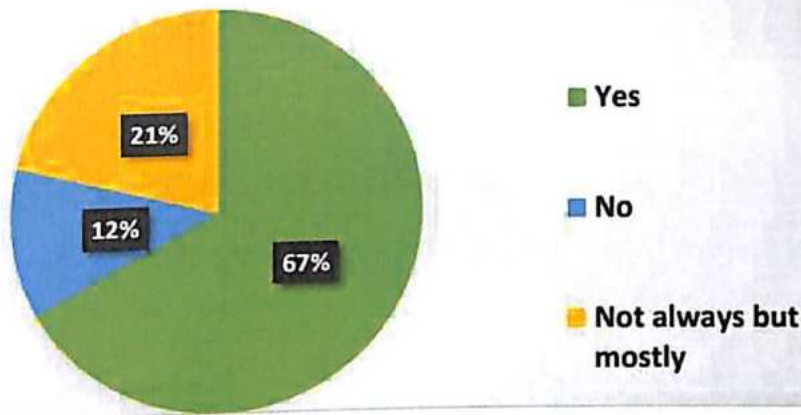


Figure 4.37 Graph representing the manner in which migrants and indigenous Koli people live together

Table 4.2.31 and figure 4.37 represent the manner in which migrants and indigenous Koli people live together in the Koliwada. From the above table and figure, it can be concluded that majority of the respondents believe that there is friendliness and peace between the two sections of people in the locality, while 21 believe that this condition does not last always, sometimes there are conflicts between them while a few respondents (12) believe that they do not live together peacefully and in a friendly manner.

• What are the problems in the Koliwada?

The respondents were asked about the problems (in general) they face in the Worli Koliwada. The data about their problems has been analysed and presented in the table 4.2.32 and figure 4.38.

Table 4.2.32 Various kinds of problems faced by the residents

Sr. No.	Problems	Frequency
1	Overpopulation	5
2	Narrow lanes	28
3	Highly congested area	5
4	Lack of sanitation	13
5	Lack of planning	6
7	Haphazard development	22
8	Improper waste management	7

9	Infiltration of migrants	4
10	Poor ventilation and drainage	10

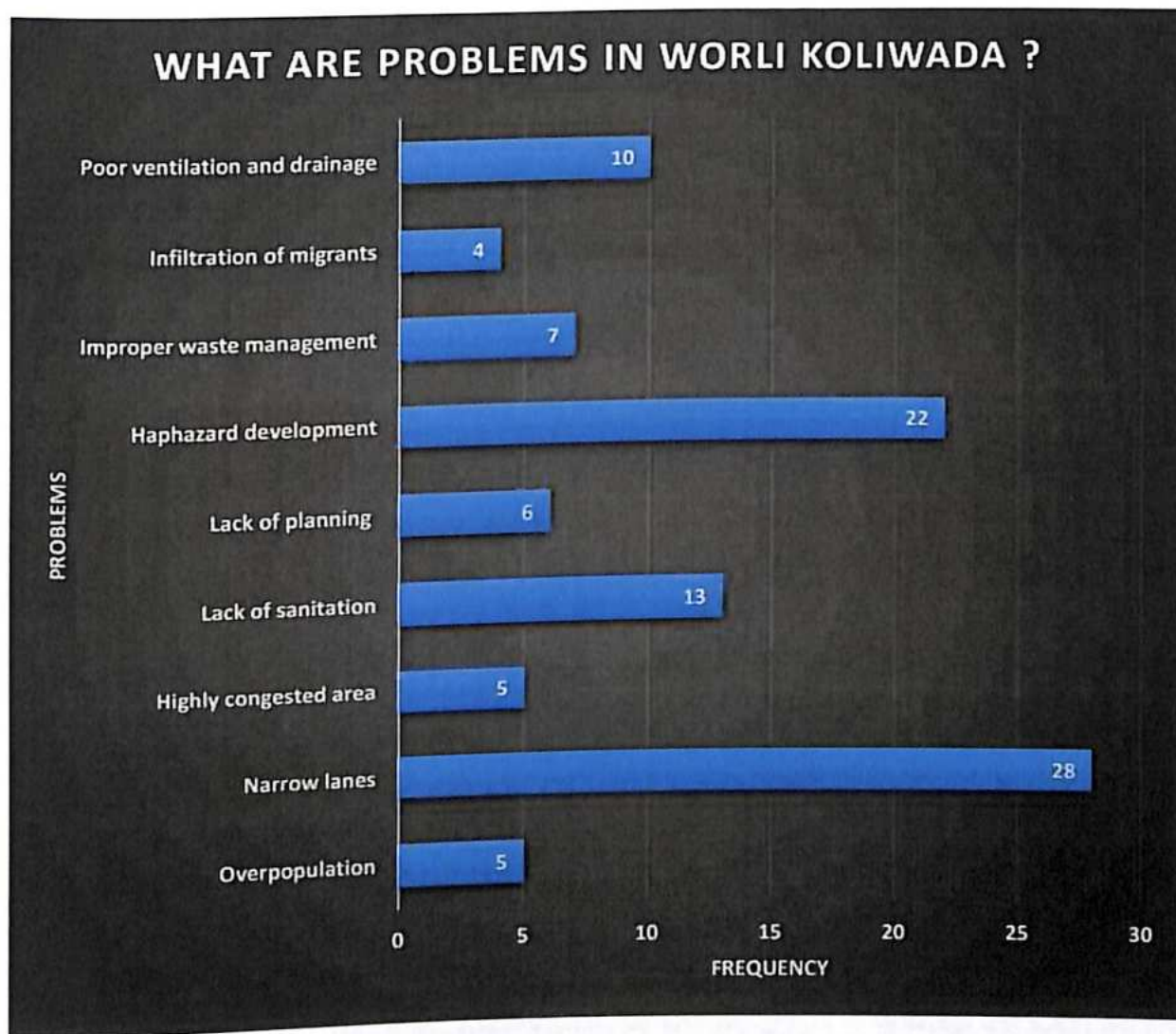


Figure 4.38 Graph representing the various kinds of problems faced by the residents

Table 4.2.32 and figure 4.38 represent the various kinds of problems faced by the residents of the Worli Koliwada. From the above table and graph, it can be clearly understood that the almost all the problems in the Koliwada are co related.



Figure 4.39 Highly congested houses of the Worli Koliwada

Majority of the respondents (28 respondents) talked about the problem of narrow lanes in the Koliwada and 22 respondents talked about haphazard development being the major problem in the Worli Koliwada. Both these problems are related to each other. 13 respondents talked about the problem of sanitation, followed by the 10 respondents saying that the major problem of the Worli Koliwada is poor ventilation and drainage.

7 respondents talked about the problem of improper waste management in the Koliwada, lack of planning (6 respondents), highly congested area (5 respondents) and 5 respondents also talked about the problem caused due to overcrowding in the Koliwada.

Problems caused due to the influx of migrants to the Koliwada was told by only 4 respondents.

From the above reasons, it can be clearly understood that these problems are interlinked. Due to cheap housing in the society (prevalence of Pagdi system), a greater number of migrants settle in this area, leading to overcrowding and congestion as the space is limited but the number of residents keeps on increasing day by day leading to unplanned and haphazard construction of houses and drains, leading to the problems of sanitation, improper waste management, lack of ventilation, pollution etc. Due to limited space and rapid construction of houses in the Koliwada, there is major problem of narrow lanes.



Figure 4.40 Haphazard construction of houses in the Worli Koliwada

In case of an emergency, ambulance and even fire brigade cannot reach to the victim or the affected house due to narrow lanes. The main road of the Koliwada is also narrow and is completely jammed during peak hours of the day (morning and evening). There is only one main road in the Koliwada leading to lots of hardships to the residents.

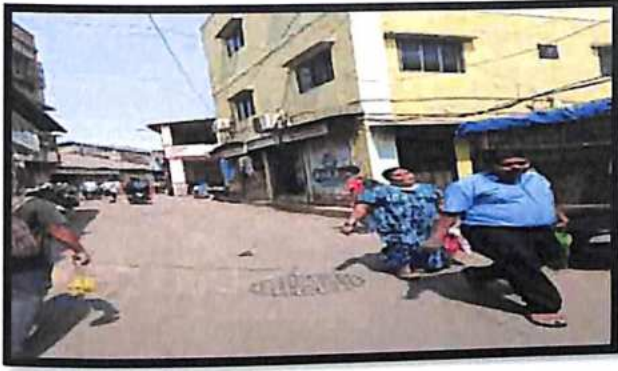


Figure 4.41 The main road of the Worli Koliwada

Moreover, the place has other issues as well. Some houses do not even have proper toilets and bathrooms, creating problems of sanitation in the surroundings. It leads to various kinds of pollution and its after effects.



Figure 4.42 Filthy water of the Worli Koliwada

4.3 CONCLUSION

The chapter clearly throws light on various aspects of socio-economic lives of residents of the Worli Koliwada and also discusses about their problems. There are various kinds of problems prevailing in the Koliwada which cause difficulty in everyday lives of the residents. The chapter also vividly discusses about the continuous migration of people to the Worli Koliwada which is the primary reason for all kinds of problems in the Koliwada. It has been observed that the community of the fisherfolks have been one of the older inhabitants and have blended into the Mumbai city life. The next generation has pursued career other than fishing and prefer to earn a living in that manner.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The study has been conducted on the residents of the Worli Koliwada in the city of Mumbai. Worli Koliwada covers a large area and has more than 40000 (Times Of India) residents, making it one of the most densely populated fishing villages in Mumbai.

The study focusses both on the original fishing community i.e., Koli community as well as the migrants in the Koliwada. Koli community is the original fishing community of Mumbai, living in Mumbai for more than 500 years. They have their own unique culture, traditions and fishing techniques. On the other hand, migrants are the people who come to this area and permanently settle over here, adding more people to the total population of the Koliwada.

In the first chapter, basic introduction about the Mumbai City was given, followed by the basis of the study i.e., "Physiographical and Socio – economic aspects of the Worli Koliwada". The first chapter included literature review, significance of conducting this study, limitation of the study and also the research statement. The objectives and the research methodology which was used to conduct the study was also discussed in the first chapter.

The second chapter was about detailed information about the fishing villages. Meaning of fishing villages was elaborated, followed by the various characteristics of fishing villages. Then, various examples of fishing villages all across the globe were discussed. After that the fishing villages in India were elaborated. Total number of fishing villages in various states of India were looked at. Then, the state wise production of fish was analysed. The five main fishing harbours in India were analysed.

The global position of India in fishing was discussed, followed by the fishery profile of India, status of fishermen and fishing community in India, fisheries in India. The main highlight of the second chapter was detailed discussion about the various socio- economic features of the Worli Koliwada.

In the third chapter, the physiography of the Worli Koliwada was analysed. The Worli Koliwada is surrounded by water on three sides. It is bounded by the water of Arabian Sea. It has rocky soil and brackish water. Worli Koliwada is situated at a higher elevation as compared to the other surrounding areas.

In the fourth chapter, detailed analysis of the study was done. Tables and graphs were prepared for each question asked during the survey. The responses were analysed and presented in the forms of tables and graphs, followed by their interpretation. The chapter indicates that there are many fishing families in the Worli Koliwada and also some indigenous people are engaged in other sectors as well. Many socio-economic problems exist in the Koliwada due to continuous influx of migrants and also the ignorant attitude of the local government towards the Worli Koliwada.

In this chapter, the major findings of the study along with the major problems of the Worli Koliwada will be discussed. Each problem will be discussed elaborately in order to understand each one of them clearly. The last part of the fifth chapter would deal with suitable recommendations for solving their problems, suggestions will be discussed for their betterment and improved living.

5.2 MAJOR FINDINGS

- Fishing mainly is the work of men. Traditionally, men used to fish and women used to sell those fishes in the market. This pattern is still followed today.
- Worli Koliwada has majority of its residents between the age group of 40 to 60. It means that the population of middle-aged people is quite high in the Worli Koliwada.
- Literacy is also quite good in the Koliwada, almost all the residents are literate except a few people. A good number of residents even have higher education. This shows the importance of education in the lives of the Koli people.
- The major religious group of the Worli Koliwada is that of Hindu Koli, followed by Christian Koli. Small population of Muslim and Buddhist people also reside in the Worli Koliwada. The population of all the other religious groups is negligible as compared to the total population of these major religious groups.
- Worli Koliwada has large number of people living on rent. Only a few people have their own houses. Pagdi system still prevails in the Worli Koliwada, under this system the residents have been living in houses for hundreds of years by paying minimal rents, in some cases as low as rupees 100 in today's times that too in Mumbai city. However, in spite of living in these houses for ages, they don't own it. Moreover, they can't do any type of construction in the houses without the permission of the Landlords.
- Fishing is the traditional activity of more than half of the people living in the Worli Koliwada which has been practised generation after generation since ages.

- However, with changing times, now many of the Koli people have shifted to other occupations as per their interests, education, needs and desires. Despite of being the main traditional economic activity of more than half of the population of the Worli Koliwada, it is practised by only a few people now.
- Majority of fishermen of the Koliwada do not travel much in order to fish, they mostly fish in the nearby areas. Only a few fishermen having their own mechanised boats travel to far off places to catch a greater number of fishes.
- From majority of families, only a few people and even a single person is engaged in fishing.
- Majority of fishermen have good experience in this field of more than 40 years.
- A good number of people have their own boats for fishing. However, the number of people mechanised boats is quite less as compared to the number of people owning traditional boats.
- Less than half of the population of the Worli Koliwada is engaged in any other occupation other than fishing.
- The non-fishermen of the Worli Koliwada are mostly the construction workers and mechanics.
- Global Positioning System (GPS) and life boats are available in good number of boats.
- More than half of the fishing community is ready to adopt new ideas and technological changes in fishing.
- Fishing does not cause any lifestyle disease. However, sometimes fishing operations may hurt fishermen, cause minor cuts on hands while pulling nets, headache, body ache and other minor health issues may be caused sometimes but fishing does not lead to any lifestyle disease.
- Fishing is a dangerous and risky task; it involves a lot of risk and fishermen need to be alert all the time. Bad weather, storms, heavy rain showers, violent winds etc cause immense trouble to fishermen and restrict them from fishing on days having such phenomenon.
- The economic position of fishermen is pretty good in the Worli Koliwada but their income isn't fixed. It mainly depends on fish catch and market prices. Changes in prices of fish lead to changes in income of the fishermen. Thus, their monthly income varies from month to month.
- The annual income of the fishing community over the period of five years has reduced. The prime reasons are the lockdown imposed by the Government and the construction of coastal projects in Mumbai city.
- The rate of immigration to the Worli Koliwada has increased over a few years. Day by day, new people are coming and settling in the Koliwada. Due to this trend, the number of indigenous Koli people has become lesser than the total number of migrants in the Worli Koliwada.

- Primary reason for migrating to the Worli Koliwada by majority of the people is the cheap housing facility available in the Koliwada. They just have to live minimal rents under Pagdi system.
- This causes trouble to the original residents of the Worli Koliwada. Majority of the native people face issues with the settling of newer people in their locality.
- The main problem cause due to the settling of migrants is the problem of over congestion.
- Most of the residents of the Worli Koliwada believe that the original Koli culture isn't affected by migrants in any manner. Moreover, the Koli culture is adopted by the migrants. They learn Marathi language, prepare fish dishes according to the Koli recipe and celebrate the festivals together in same manners as Kolis do.



Figure 5.1 Indigenous Koli community and the migrants celebrating the festival of Holi together in the Worli Koliwada

- There are many problems prevailing in the Worli Koliwada such as congestion due to overcrowding, lack of space, poor ventilation and drainage, small and highly dense houses etc. These problems prevail due to residence of large number of people in a small area. Although the Worli Koliwada is spread over a large area but still now it is saturated to occupy more migrants. Due to continuous inward movement of people, these problems are also intensifying day by day and need to be considered seriously by the migrants as well as the native people of the Worli Koliwada.

5.3 PROBLEMS OF THE RESIDENTS OF THE KOLIWADA

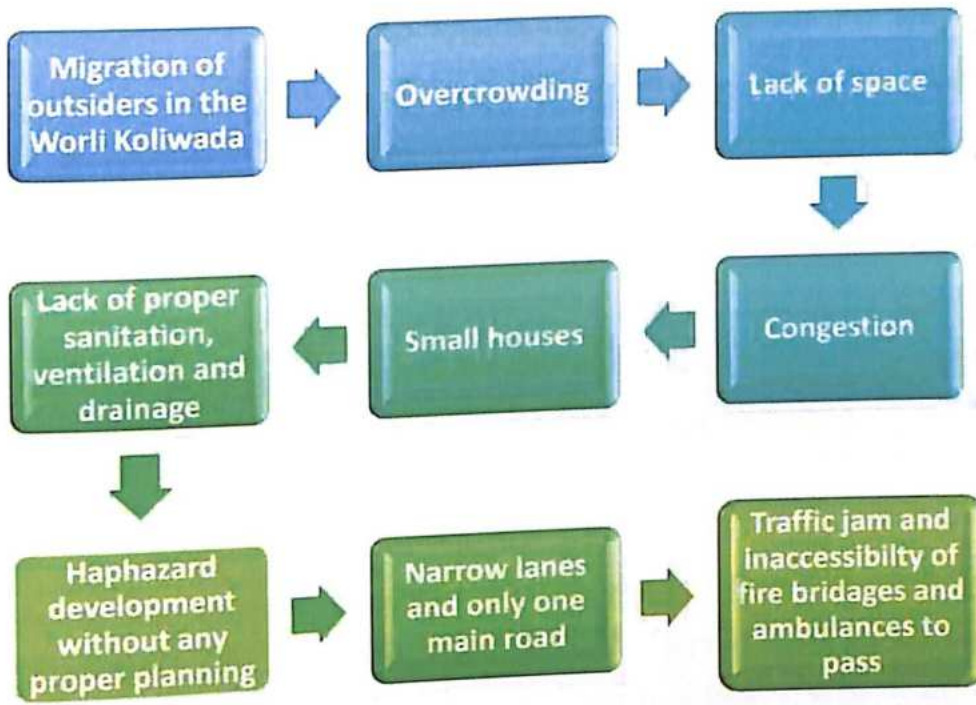


Figure 5.2 Representation of the chain of problems present in the Worli Koliwada

- The major problem faced by the residents of the Worli Koliwada is the problem of narrow lanes. The lanes in the entire Worli Koliwada are extremely narrow. The Koliwada has only one main road that two without any division for the vehicles moving in opposite directions. All the vehicles and people have to use the same road for passing through the Koliwada. It creates traffic jams during the peak hours especially during morning and evening.
- During morning, children leave the houses for reaching schools on time and also the adults do the same to reach to their offices and other work place. Hence, there is a lot of rush on the only main road of the Koliwada, which causes immense inconvenience to all of them using that road.
- Apart from traffic jam on the main road of the Koliwada, there are numerous narrow lanes in the Koliwada, these lanes are built between the houses haphazardly, they are built without any proper planning, hence they prove to be misleading for the outsiders and also to the new people happening to come to the Worli Koliwada. These lanes are so compact and dense that they don't even allow ambulances and even fire brigades to pass through them.
- Due to lack of space, ambulance and fire brigades are unable to reach to the victim and affected house respectively. This can prove to be highly fatal, leading to massive loss of life and property in case of major accidents,
- Second major problem of the Koliwada is lack of ventilation, drainage and sanitation. Due to limitedness of space and increasing number of people in the Worli Koliwada, these problems are also growing day by day. As discussed above, due to the continuous influx of migrants in the Koliwada, the place is getting congested. Illegal houses are also constructed to support the

growing population of the Koliwada. These houses are just constructed without any proper planning leading to further problems. Being intensely compact settlements, houses lack proper ventilation, drainage and sanitation.

- Third major problem in the Koliwada is the poor waste disposal. Worli Koliwada lacks hygienic environment for the people to live soundly. The Koliwada is surrounded by water body on three sides. This water all around the Koliwada is highly polluted. There are many people in the Koliwada who do not have the toilets in the houses. They defecate in open on daily basis. All the other solid wastes produced in the area is many a times dumped into the water bodies surrounding the Koliwada.
- Fourth major problem of the Koliwada is the problem faced by the fishermen. Due to construction of various coastal projects in the city of Mumbai, their fishing territory is reduced. They are prohibited by the government to fish beyond a fixed limit but fishermen complain that territory to be too small to fish. Fishermen continuously demand to increase their fishing area. However, their demands are often neglected by the Government.
- Construction of Bandra Worli Sea Link has also reduced the fishing territory. Hence, the fishermen do not favour the construction of such projects in Mumbai.
- Apart from reduction in the fishing territory, the construction of these marine projects also creates hurdles in the smooth movement of boats. Due to construction of bridges on seas, the pillars are used to support the roads constructed over the water, these pillars sometimes limit the space for movement of huge ships.
- On normal days having good weather, the boats pass easily in between the pillars but on windy days or any other day with bad weather, boats may hit these pillars because of high velocity winds, this will cause huge damage to the ship or boat, may lead to overturning of boats/ships. Such accidents may cause huge loss of life and property within a few seconds.
- Hence, the fishermen demand to increase the gap between the two pillars of sea link but government cannot do so as this may not be beneficial for the stability of the bridge.
- Fifth major problem of the Worli Koliwada is government authorities do not pay much attention to the needs of the people in Worli Koliwada. Before elections, politicians visit the area, make false promises to people, then after the elections. They don't work for the development of the Koliwada. The work of roads, drainage and other things aren't done in an efficient way. The residents themselves have to find solution to their problems and they only have to look after their needs. The Corporate of the area seems to be least bothered about people's needs and wants. As much as the residents can do, they do for themselves as they cannot rely on the government bodies.

5.4 RECOMMENDATIONS

In order to reduce the problems of the residents of the Worli Koliwada the following recommendations are given-

1. There should be proper planning before constructing any house in the Koliwada. Planning should focus on well-lit houses with good ventilation and drainage.
2. Residents should understand the importance of proper waste management. Dry and wet wastes should be separated before being discarded. Recyclable wastes should definitely be recycled in proper manner and other wastes should also be disposed appropriately rather than being dumped into the surrounding Arabian sea.
3. Two-way road should be built in the Koliwada in to reduce traffic jam and for smooth and easy movement of vehicles and people in the Koliwada.
4. Koli community should have other options apart from fishing to earn money so that their income isn't affected during rainy season or on days having bad weather.
5. Fishermen whose who are willing to adopt new ideas and technologies but are unable to do so due to lack of capital should be helped financially. They should be given loans on easy returns so that they can buy big mechanised boats equipped with high tech machines, so that their fish catch increases and their financial status will also be upgraded.
6. Local Government authorities should properly take care of the needs of the residents. The problem of roads, drains and illegal construction in the Koliwada can only be solved by the immediate attention of the local bodies into the matter. The politicians who are responsible for the development of the Worli Koliwada should fulfil their responsibilities in an honest way and should work for the betterment of the people.
7. Illegal construction of houses, shops etc should be banned in the Worli Koliwada.
8. The fishing community should get larger area to fish as per their needs. Their genuine demands should be fulfilled by the government bodies.
9. The entire Koliwada should be redeveloped, then only all the above problems can be solved in the most efficient manner.
10. Government should make some welfare policies aiming at the safety, welfare, betterment and empowerment of the fishing community.

5.5 INITIATIVES BY THE GOVERNMENT

1. **Fish Market Price Information System (FMPIS)** is started by National Fisheries Development Board to collect the prices of the commercially significant fishes all across India. It is helpful both for sellers as well as the buyers.

2. **Fisheries Infrastructure Development Fund** – It is set up by the Union Government, it was announced on the National Fish Farmers' Day. The main objective of Fisheries Infrastructure Development Fund is to boost the fishery sector. This is part of Blue Revolution.

5.6 CONCLUSION

The study was conducted on the residents of the Worli Koliwada. The focus of the study was to study about the physiographical and the socioeconomic aspects of the Worli Koliwada. From the study, it is clear that there are many problems in the lives of people in the study area, still the migrants and the indigenous people live together peacefully and more or less in a friendly way. Sometimes they may have a few issues with each other but this does not lead to permanent enmity. They adopt each other's culture especially the migrants learn about various aspects of the Koli culture. They also speak Marathi and dress like Kolis on festivals and other special occasions. Koli

Today, not every Koli is engaged in fishing. After getting education and some profession training, some Kolis have shifted to other professions as well. Cultural amalgamation is taking place in the Koliwada.

CHAPTER 6

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APPENDIX

APPENDIX NO 1

• QUESTIONNAIRE

Gender

Religion

Age

- Less than 20
- 20 to 40
- 40 to 60
- Above 60

What is your educational qualification?

- Illiterate
- Primary
- Secondary
- Highschool
- Graduate
- Post graduate
- Ph. D

What is the status of ownership of your house?

- Rented
- Owned
- Both

Is fishing your traditional economic activity?

- Yes
- No

Is fishing your main economic activity currently?

- Yes
- No

Where do you fish?

- Worli
- Madh
- Versova
- Gorai

- Colaba
- Not confined to any particular location
- Other:

How many members of your family are engaged in fishing?

- All
- Only me
- All males
- None

If fishing is your main economic activity, for how many years have you been engaged in this occupation?

- Less than 5 years
- 5 to 10 years
- 10 to 20 years
- 20 to 40 years
- More than 40 years

Are you engaged in any other occupation other than fishing or is any other activity other than fishing your main source of income?

- No
- Yes

If yes, which activity do you practice other than fishing or what is your main source of income (if you don't fish)?

- Your answer

If involved in fishing, do you own and use your own boat?

- Yes
- No

If yes, what kind of boat do you own?

- Traditional
- Mechanised
- Both

How far from the shore do you go for fishing?

- Less than 2 miles
- 2 to 4 miles
- More than 4 miles

- Depends on situation and season

What kinds of equipment do you have in your boat?

- Global Positioning Machine
- Deck Light for night fishing
- Life jackets
- Sound signalling devices
- No equipment
- Other:

Are you willing to adapt new ideas and technological changes in fishing?

- Yes
- No
- May be

Are you suffering from any lifestyle health issue especially because of fishing?

- Yes
- No

If yes, what kind of health issue or injury do you do face?

- Your answer

Do you face any danger while fishing?

- Yes
- No
- Sometimes

If yes, what kind of danger do you face?

- Your answer

What is your monthly income from fishing?

- Less than 10000
- 10000 to 20000
- 20000 to 40000
- More than 40000
- Prefer not to say
- Depends on the fish catch and the market prices
- Not fixed, varies from month to month

Over the last 5 years, how has your income from fishing changed?

- Increased

- Decreased
- Stable
- Varies from year to year

Please state the reason for the change in income over past the five years.

- Your answer

Are you an immigrant to Worli Koliwada?

- Yes
- No

If yes, why did you migrate to Worli Koliwada?

- Cheaper housing
- Better occupation in Koliwada

Do you have any problem with migrants settling in Worli Koliwada?

- Yes
- No
- Sometimes

If yes, what kind of problem is it?

- Your answer

Is Koli culture affected by the immigrants in any manner?

- Yes
- No
- Maybe

Do migrants adopt Koli culture in any manner?

- Yes
- No

Do migrants and indigenous people live peacefully and in a friendly manner in the Koliwada?

- Yes
- No
- Not always but mostly

What are the problems in the Koliwada?

- Your answer

APPENDIX NO 2



Plate No 1 Koli fishermen engaged in their day-to-day fishing related chores



Plate No 2 Fishes and related things

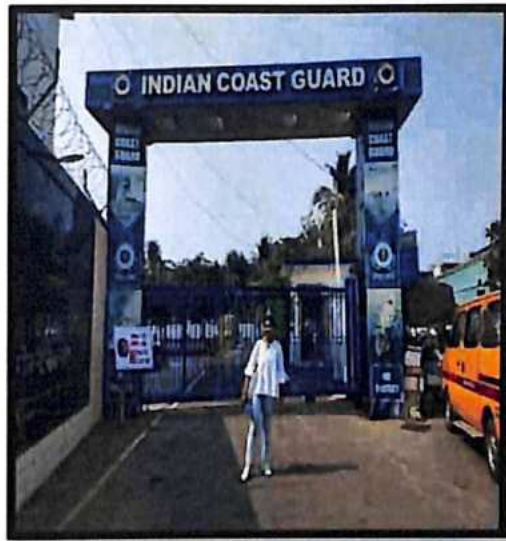
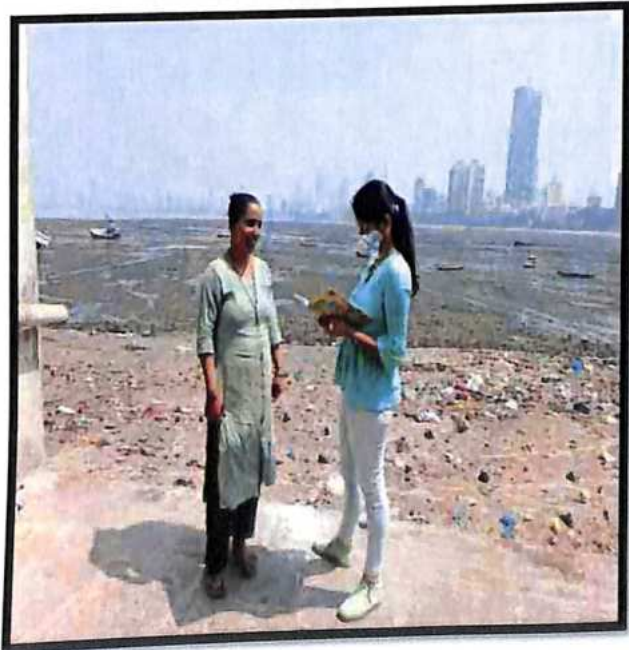


Plate No 3 Important bodies looking after the welfare of the Worli Koliwada



Plate No 4 Kolis celebrating their festivals



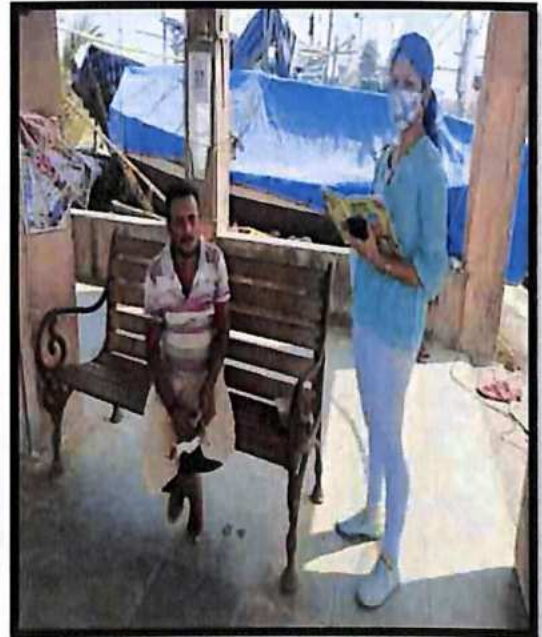
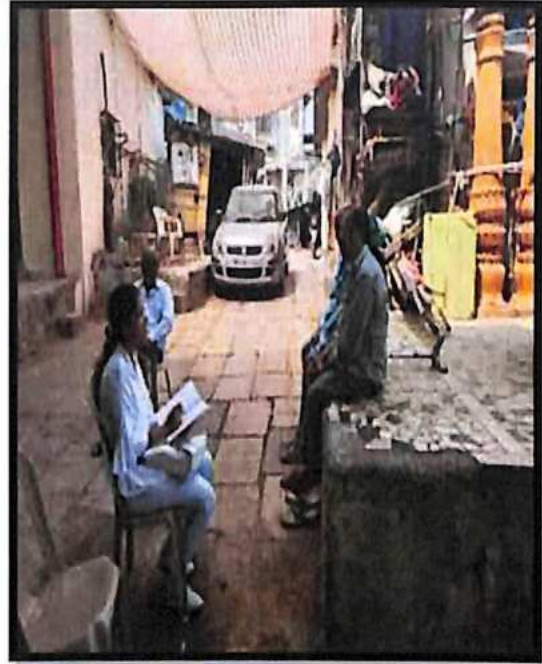
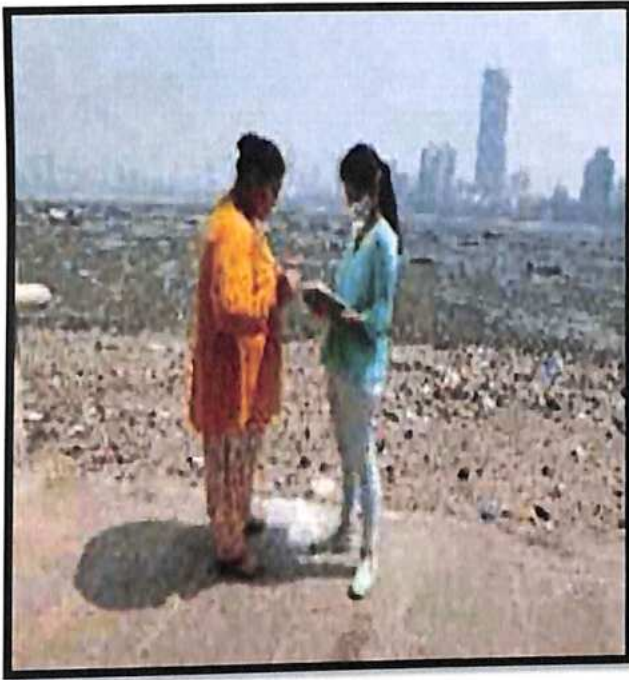


Plate No 5 Questioning the respondents during survey in the Worli Koliwada

PAPER NAME

Dissertation

AUTHOR

Riti Kushwaha

WORD COUNT

22782 Words

CHARACTER COUNT

118042 Characters

PAGE COUNT

116 Pages

FILE SIZE

19.2MB

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REPORT DATE

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