Title

"Challenges Faced by the Fishing Community: Study of Versova Koli Wada Community"

By

Mrs. Allva Frank Dmello

A DISSERTATION

Submitted To

Department of PG Geography,

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

In partial fulfillment 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 **Mrs. Allva Dmello** has successfully completed the Dissertation as a part of the MA-II- Semester IV syllabus titled **"Challenges Faced by the Fishing Community: Study of Versova Koli Wada Community"** 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 "**Challenges Faced by the Fishing Community: Study of Versova Koli Wada Community**" is my own contribution. The dissertation is carried out under the guidance of Dr. Chandani Bhattacharjee in the academic year 2021-2022.

SIGNATURE OF THE CANDIDATE

PLACE: MUMBAI

DATE: 25th April, 2022.

Acknowledgment

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Foremost, I would like to endeavor to our god almighty for the wisdom he bestowed upon me, the strength, peace of my mind, and good health in order to finish this research.

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Mrs. Allva Dmello

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CHAPTER 1

INTRODUCTION TO THE STUDY AREA OF MUMBAI

1.1 Introduction:

Mumbai welcomes people of all communities. It is also called the city of dreams or the city of gold. People from different places, caste, and communities have made their home here. Koli fishing community people are known to be the original residents of Mumbai. Mumbai has a coastal area which is one of the greatest sources of carrying out the fishing activity. So Koli people are known as the original inhabitant of Mumbai. For almost, 500 years Koli people were living and earning their livelihood from the coastal areas which were known as the seven islands and now it is known as Mumbai city. During the time of sunrise, Sassoon Dock is noticed to be a busy place that blows up with energy, color, tradition, smell, etc. Some of the places in Mumbai were named after the Koli fishing community known as Worli and Dongri. It is said that Mumbai obtained its name from the Koli in the 16th century which was named after their goddess and their patron deity, Mumbai Devi. It is assessed that almost 5,00,000 Kolis were residing nearby Mumbai. Nowadays also most of the Kolis still carry out fishing activities.

During the time of the pre-colonial period, Mumbai consisted of seven different islands. These islands later came together which became the home for 'Koli fishers' known as 'Mumbai Koli Wadas'. The Koli's a traditional fishing community in Maharashtra, were the natives of Mumbai.

Most of the men and women residing in Koli Wada in Mumbai areas have involved themselves in fishing activity which has given rise to industrialization in fisheries. Women have become a cheap and important source of labor in the fish factory. Some of the women also harvest shellfish like oysters and mussels at the time of Low tide near the coastal areas. Some of the techniques followed by the Kolis for fishing were spearfishing, angling, trapping, netting, and bow and arrow. These techniques were used based on the size and type of the fish.

Fishing has become a challenging aspect for the fishing community because of the increasing temperature and greenhouse gasses which have affected marine species. This affects the livelihood of the fisheries who are totally dependent on it and this has forced them to take the alternate option to fulfill their needs. In the coming decade, climate change will have a tremendous effect on marine resources. Because of the increasing demand for big fish by the consumers, they have been caught before their growth and biodiversity have been affected.

A Maximum number of people belonging to the Mumbai fishing community have made their home at Versova beach. Other fishing communities from Karnataka, Andhra Pradesh, and Tamil Nadu have migrated to Versova to earn their livelihood. This study provides a clear understanding of the challenges faced by the fishing community of Versova in the city of Mumbai.

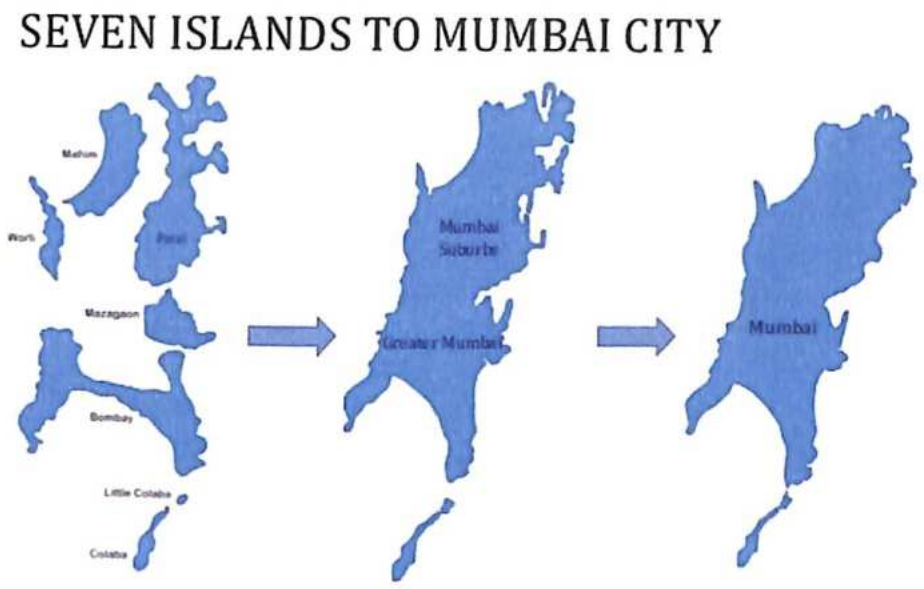

Figure 1.1.1 – Seven Islands of Mumbai

Source - https://www.quora.com/Are-Mumbais-7-islands-a-part-of-Mumbai-or-separate-from-Mumbai

1.2 Research Objectives:

- To understand environmental problems and awareness of Versova.
- To study the lifestyle of fishing communities living in Versova.
- To understand the problems faced by the fishing community.
- To understand the changing trends in fishing activity.
- To study the socio-economic factors of Versova.
- To understand the equal status of men and women in the community,
- To highlight the settlement, sanitation, and development of Versova.

1.3 Review of Literature:

(Pranita A Harad and P.P. Joglekar, 2017) The Researcher in his article stated that Kolis of Maharashtra are basically classified into Dongri Kolis and Fishermen Koli. The Dongri Kolis are further classified into many groups and there are 27 communities of fishermen Kolis in Maharashtra (Ghurye 1969: 1-15) which are further grouped into Son Kolis, Vaitee Kolis, and Mangela Kolis based on their type of fishing activity which is carried out in salt and sweet water bodies. In Mumbai, Koli settlements are mostly seen in Sion, Worli, Versova, Mazagaon, Vasai-Virar up to Ratnagiri, etc., they are well known as fishing villages. Though they go through

many problems and effects of staying in urban areas, still they have tried to preserve their culture and fishing activity which is the important source of livelihood. They are well known for their beautiful culture and tradition. Fishing is considered as their main occupation to fulfill their needs. Many fishermen have made fishing as their source of income. **(Banti Debnath, M. Krishnan, P. S. Ananthan and Biswajit Debnath, 2016)**, his research article stated that because of the increase in temperature the people belonging to the fishing community had to go through a lot of hardship. Climate change leads to the movement pattern of fish in the seawater and even the mortality rate of the fish is on a large scale. This has created a huge influence on the life of fishers in the coastal areas. The increasing temperature has led the fish to migrate to a place where the weather is favorable. Many of the marine resources are getting declined day by day. Climate change has become a threat to marine resources. The study concludes to be conscious of climate change and how to get themselves adjusted in the environment in Versova fishing village of Mumbai. The women respondents were very much clear about the climate change taking place and its impact on the fisheries **(Shyam S. Salim, 2007)**, The researcher has concluded that India has a coastline of 8129 km which clearly means that India has most of the coastal places where fishing activity is carried on. In the year 2002-2003 almost 6.05 tones of fish production were seen. The fishing activity was carried out by making use of 53,000 mechanized vessels out of which 75% were trawlers. Because of the trawlers, the local fishermen had to go through difficulties where their level of income started declining. They had to face problems like poverty, an increase in debt, and so on. Traditional and mechanized boats are used by fishermen to obtain fish. But the trawlers which are used in deep fishing have caused danger to the fish. They make use of the ALD light which is one of the reasons for the decline of fish nowadays. **(Harjit Kaur Kohli & P. V. Subba Rao, 1984-85)**, His research paper stated that Versova creek joins Malad creek and further it joins the Arabian sea. These creek helps to carry out fishing with the help of boats, further, they are been transported to the nearby marketplace. Madh Island is connected to Versova fishing village with a jetty. A number of people residing there move from one end to another. About, 3.67% of the total fishermen population residing in Versova are owing their own fishing boats. They along with their family are involved in this occupation. As the fish gets transported from the fishing village to the consumers the value of the fish increases. It also gets transported to foreign countries. **(Sibananda Senapati and Vijaya Gupta, 2015)**, stated in their research paper that Mumbai has the largest population. It is also called the city of gold and it also welcomes the people of the fishing community. Because of climate change, a rise in sea level takes place, floods, changes in rainfall patterns can be observed. This has a huge loss on the life of the Koli community. They have to adapt to a different source of income to fulfill their needs. The fishermen who make more use of mechanized boats have more information about climate change. The fishermen who are owning a boat make use of GPS to navigate when they go out fishing. This climate change leads to the depletion in the quantity of fish. This change in climate, pollution of coastal seawater, and overfishing have reduced the number of catches. The level of pollution has increased to a large scale because it has become difficult to even find the fish in the seawater. **(V.V.Singh and S.G.Raje, 1998)**, in his finding has concluded that Versova creek is a place where organic and industrial waste is being let out in the water. The water of the creek has become brackish, due to which it has forced the fish to migrate to a safer place. This has caused the depletion of a fish

catch because of the increasing mortality rate of the fish. Mumbai has become one of the urban cities. This has given growth to come up with multiple industries. Because of urbanization, industries are releasing waste in the seawater after every interval. This has given rise to conflict with regard to development work and fishing activity. If everything is monitored properly less harm can be seen in the ecosystem and marine life. So, there should be some alternative where they can leave the waste. **(S. G. Raje, V.V. Singh, And Arpita Sharma),** in his research paper concluded that fishing is one of the important occupations. It has provided almost 5.9 million occupations to the fishing community (Sinha 1998). Fishing provided job opportunities to unemployed people and also the poor. The people living in the coastal area opted for fishing as their only source of income as it was convenient for them to travel. Men, as well as women, equally participated in fishing. It shows that most of the women engaged themselves in fishing activity to the marketing of fresh and as well as dry fish. Most of the men go fishing and women are into marketing. Some women are also into collecting clams and other shellfish near the coast during the time of low tide. **(Shyam S. Salim, Hena Vijayan, And K. M. Sandhya, 2010),** During the monsoon, the ban was introduced and this led to severe problems among the fishermen belonging to different states. The fishermen had to move to a different place in search of a job as they were not allowed to go fishing. Life became miserable because of the ban it had a huge change in the life pattern of the fishermen working in trawlers. As a result, they had to face problems like poverty, low level of income, debt, etc., (Kurien John, 1978,1995; Datta et al., 1989; Joseph Sherry, 1995). They had to work hard to make their end meet. During the period of the ban, there was a lack of support from the government which resulted in unemployment. They were been promised help by the government but it was not been provided. **(Suraj Kumar Pradhan1*, S. Abuthagir Iburahim1, Latha Shenoy1, Ram Singh1, and A. D. Nakhawa2, 2019),** has concluded in the research paper that in countries like India, Bangladesh, Myanmar, etc., Dol net was used by small-scale fishermen. These are the traditional method of fishing which is being practiced. But its uses were banned in the northwest part of India (Ahmed and Troell, 2010). It affected the fishing activity. **(Peke, Shuddhawati, 2013),** in his research paper stated that Government schemes have been introduced to look after the problems of the fishermen (Joseph C., year unknown), Mostly the women's tried to be into carrying out harvesting fish and selling them in the market (Mohite S.,2010). More than men women were into marketing. It also studies the challenges faced by the women carrying out fishing and selling them in the market. Even dry fish is sold by the women in the market. **(Hemant kumar A. Chouhan1 • D. Parthasarathy1 • Sarmistha Pattanaik, 2016), in his research paper** has concluded that rapid growth is taking place in Mumbai. Because of urbanization, development is also taking place near a coastal region, which has created problems for the fishing community. Because of increasing industrialization, the waste is left out in the seawater which has caused pollution in the sea. As a result, fish has started declining. It has become difficult to fulfill their needs. The people belonging to the fishing community are trying to conserve the coastal areas because it is one of the greatest sources of livelihood. People found if coastal areas are not being conserved then it is going to affect them. According to the researcher, it is stated that it is necessary to have Coastal Zone Management Committee work for the betterment of the fishing community, they found through this committee they can save the coastal area, giving hope to the fishermen. **(Jenia Mukherjee),** The research paper has stated that because of development in the

urban areas the fishing community are facing problem like pollution or decrease of wetland and depletion of fish in the seawater. The increasing pollution in the seawater has left the seawater brackish in color and hence it has given rise to the death of the fish. This has made a difference in the basic income of the fishermen who were completely dependent on fishing activity. **(Hemantkumar A Chouhan, D Parthasarathy, Sarmistha Pattanaik, 2016)** The research paper states that the fishermen were being crushed down by the trawlers and also because of the increasing infrastructure. The CRZ is trying to bring balance to the ecosystem. (Ranade 2008), stated fishing communities from different states come to Mumbai to fulfill their needs, but this has led to less availability of land. The land which was used by the fishermen for their needs was being used for industries and for the construction of roads. This brought a huge impact on the fishermen. Because of the increasing number of migrants, land has become less and has given rise to problems such as health facilities and housing in Koli Wada. **(Hans Nicolia Adam, Synne Movik, D. Parthasarathy, Alankar, N.C. Narayana and Lyla Mehta, 2005)** His research paper concluded that the development near coastal regions has given rise to flooding giving a rise to the level of water. Climate change means the change in rainfall patterns, heatwaves, and winds. When there is a change in the pattern of climate it affects the marine ecosystem. A place where fishing activity is carried on, have been moved to another place because of the fish which are getting migrated to a safer place or are become less which is because of pollutants from industries, or because of the debris dumped in the seawater. It is just a loss to the marine ecosystem. **(K. M. Siokotariai, G. S. Temkar1, P. Abdul Azeez*2 And K. L. Mathew1, 2018),** has stated that Dol netting is one of the traditional and effective techniques to carry out fishing, which is specially used in Gujarat and Maharashtra. Raje and Deshmukh (1989) have stated that near Versova, Mumbai, Maharashtra has seven parts in Del net that is Mohor (11 m), Chirat (13 m), Katra (13 m), Mazvala (16.5 m), Khola (5.5 m), Par (5.5 m) and Ambadpar (5.5 m). The total profit gained by Dol netter at Versova was from around `16,988 to 23,411 and for small it was from`10,094 to 32,897 and for medium size dol netters in the year 1983-86 (Raje and Rammurthy, 1990). **(Mane Sushant and Sundaram Sujit, 2014),** in research paper stated that Mumbai industrialization is causing harm to the marine species. Because of the industrial untreated sewage, the creek has become polluted, it has left the water brackish in color. In spite of pollution, some of the shellfish are found in rocky areas which are removed by the women and sold in the market. Versova is said to be one of the most polluted creeks of Mumbai. The average salinity is from 7.9 to 33.34 ppt and the dissolved oxygen level is from 0.41 to 2.75 mg/l. the oxygen level is very less in Versova creek because of which fish has started migrating. **(Urdhva Mula, 2017),** in his research paper stated that the Koli group was existing for a very long time. Till 2012 the women of Koli Wada were having the right to discuss the problem in connection to selling the fish in the market, but the men didn't consider women as the part of ancient Koli group. Koli group made use of special meetings where their ideas and views on a particular issue can be exchanged. The people of Versova Koli Wada community used to offer tokril of fish in the temple which is in their village. The women of the Versova Koli Wada region have to face a lot of challenges with regard to space when they have to dry fish. **(Sibananda Senapati),** has stated that because of the increasing development, the areas which come under fishing regions are facing a number of problems like under construction, climate change, change in rainfall pattern, increasing sea level, rise in temperature which is creating a threat for the

fishermen to fulfill their livelihood. This has again resulted in the decline of fish and migration of fish to a different region (Coulthard, 2010; Badjeck et. al., 2008). To benefit the fishermen the government has to take the initiative and help the small-scale fishermen by restricting to make use of mechanized boats near to seashore, enlarging the size of nets, and training the small-scale fishermen how to catch the fish. This will almost solve the problem of fishermen. **(A.G. Kalawar, 1981),** in his study stated that in India, Maharashtra state is considered as one of the most important states to carry out fishing industries that are making use of the mechanized boat. Traditional boats like 'Machawa', 'Balyao' and 'Kota' are being used by the fishermen. They even made use of bag net, gill net, hooks and lines, Bokshi and Rampan. When compared to mechanized and traditional boats, mechanized is more convenient for fishing. According, to 1960, Maharashtra Fisheries Act, the state government has taken certain measures to protect the marine resources from decreasing. The fishermen who were engaged in carrying out fishing activity near the creek were forced to give up their occupation because of pollution and try to get themselves in some kind of work. **(Taarika Ganesh and Chadchan Jayprakash, 2021),** in their research paper have concluded that for 500 years Kolis used to stay in Mumbai. It was called their hometown. It is said that Mumbai is named after the Koli community. Because of economic development, the fishermen have to face a number of challenges some of them even give up fishing activity which was their means of living. They are also facing one of the serious issues which is the Coastal Road Development Project, due to which the fishing community had to lose their land. Many youths from the fishing community are trying to give up the fishing occupation and they are trying to engage themselves incorporate to earn their livelihood.

1.4 Research methodology:

Pre-field - Topic was selected for research. A well-structured questionnaire was prepared in Google form. Data was collected from secondary sources such as online journals.

On-field - The field survey was conducted in the Versova fishing community. Several visits were made to the study area to collect data from the respondents. A random sampling method was used to collect the information from the respondents. All the areas which were selected for the survey were surveyed. The survey was conducted in the month of March 2022.

Post field – The collected data was segregated, stored, tabulated, accessed, and analyzed. Maps have been prepared using GIS for a better representation of the conclusion. Limitations have been identified and results were interpreted and suitable recommendation is given.

Figure 1.4.1: Research methodology

1.5 The implication of the study:

- To find out the problems faced by fishing communities.
- To know environmental problems and awareness of the region.
- To know the lifestyle of fishing communities living in the region.
- To find the changing trends in fishing activity.
- To know the socio-economic factors of the region.
- To investigate the equal status of men and women in the community,
- To investigate the settlement, sanitation, and development of the region

1.6 Statement of the research problem:

The fishing community is facing a number of problems, from fishing to carrying out trade. It has become a challenging aspect to fulfill their needs. Due to the increasing development which has increased the industries have polluted the seawater, creating the fish to migrate to a safer-places. Even climate change has impacted the life of fish, causing the depletion of marine biodiversity. The fishes move to the cooler place and this has caused a huge problem for the fishermen carrying out fishing. Some fishermen also make use of trawlers in deep fishing and the use of ALD light has caused a huge problem for the local fishermen.

1.7 Limitations:

Every study is conducted under some limitations and this research is not an exemption. The limitations of this research are as follows:

- The basic problem that was faced was those linguistic differences, the Koli Wada had people residing from different states, and many did not follow the standard Marathi language.
- It was also found that there was general apprehension among the respondents about sharing data for the fear of reprisal.
- The other limitation was the difficulty in zonation of the study area.
- As a female researcher, it was difficult to enter several parts of the study area as it did not seem very safe.

1.8 Conclusion:

This chapter is a basic introduction to the fishing community of Mumbai and the basis of the study that would be conducted. It also explains the objectives and the methodology that would be followed in the study. The following chapters deals with the study area, where the study would be conducted and the method to be followed.

CHAPTER 2

COASTAL HAMLET – KOLI WADA FISHING COMMUNITY – VERSOVA

2.1 Introduction:

Versova is located in the north-western part of Mumbai. Versova Koli Wada region is located by the side of Malad creek. It faces towards the Arabian sea, because of which a large number of fishing communities inhabit one end of the Versova beach. It has a community that consists of 50000 residents who are categorized as slums as per the government. Versova beach is one of the famous beaches which is situated in Mumbai. One of the interesting things about Versova beach is, that it is connected to Juhu beach which is again being separated by many creeks. It is located in the suburbs of Andheri west.

Versova Koli Wada is called a shelter for a large number of fishing communities known as 'Kolis'. These fishing communities are well known for carrying out fishing activities selling the fish in the market and also carrying out an auction every day. The fisherfolk sells the fish in bulk for a lesser cost near Versova jetty. This is being managed by a cooperative society from where all the fishing activity is carried on. Versova port was considered as one of the important ports to carry out trade in Mumbai. It is also famous for its scenic beauty, and huge rocks that act as a barrier to protect the people from huge waves which head from the Arabian Sea. Another captivating view is to watch the fishermen going fishing.

For the past few years, the local people and the BMC are trying to change the situation of the beach. Save Versova Beach Association was brought into existence to provide all the facilities required on the beach.

2.2 Defining the fishing community

A fishing community is a community those are completely dependent on fisheries to fulfill their social and as well as economic needs. Kolis is one of the famous fishing communities in Maharashtra. They are also called Kori, which means caste that has been divided into many groups, living in the central and mountain regions of India. The highest number of Koli inhabit Maharashtra, especially in Mumbai, and Gujarat, and their main occupation is fishing. But now some of the Koli are working in government sectors. There are some Koli staying on the land, they are known as land-based Koli. They are engaged in cultivating crops. The Kolis are grouped as Scheduled Caste in the constitution of India. The Koli who practice fishing is known as Son Koli and those who practice agriculture are known as Hill Kolis, the Chunvalia Koli were familiar with crimes but now they are working as an agriculturalist.

Today, in India one can find Koli settled on the basis of the languages of the regions from Kashmir to Kanya Kumari. There are different groups of Koli, they are;
Koli Kshtria, Koli Raja, Koli Rajput, Koli Suryavanshi, Nagarkoli, Gondakoli, Koli Mahadev, Koli Patel, Koli Thakor, Bavraya, Tharkarda, Pathanvadia, Mein Koli, Koyeri, Mandhata Patel etc. It is said that there are almost 1040 subdivisions in the groups, and in this group, all the people belonging to the Koli are sorted together as the Koli in the population census.

Figure 2.2.1: World map showing India
Source: https://printing.omet.com/en/omet-announces-opening-of-omet-india-subsidiary/

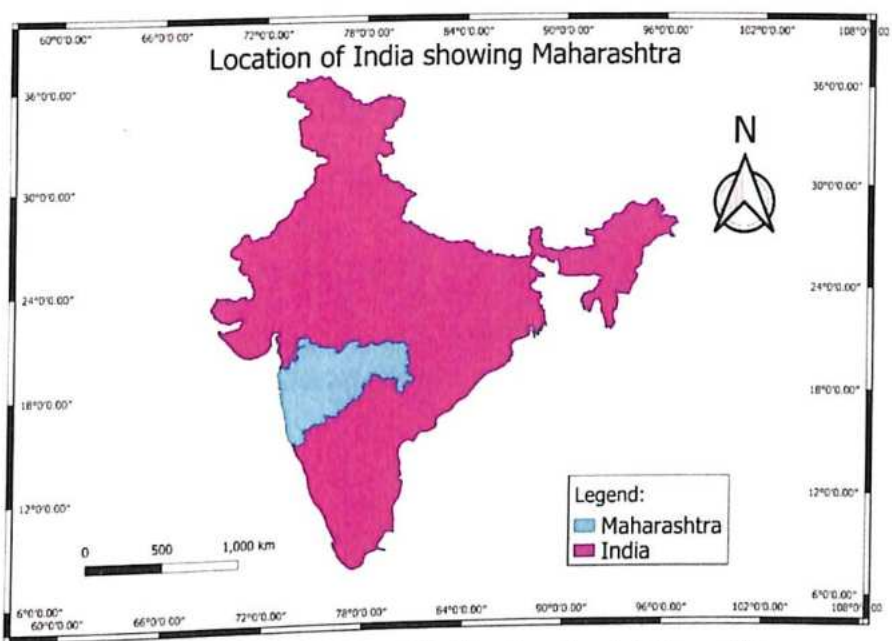

Figure 2.2.1: Location of India showing Maharashtra

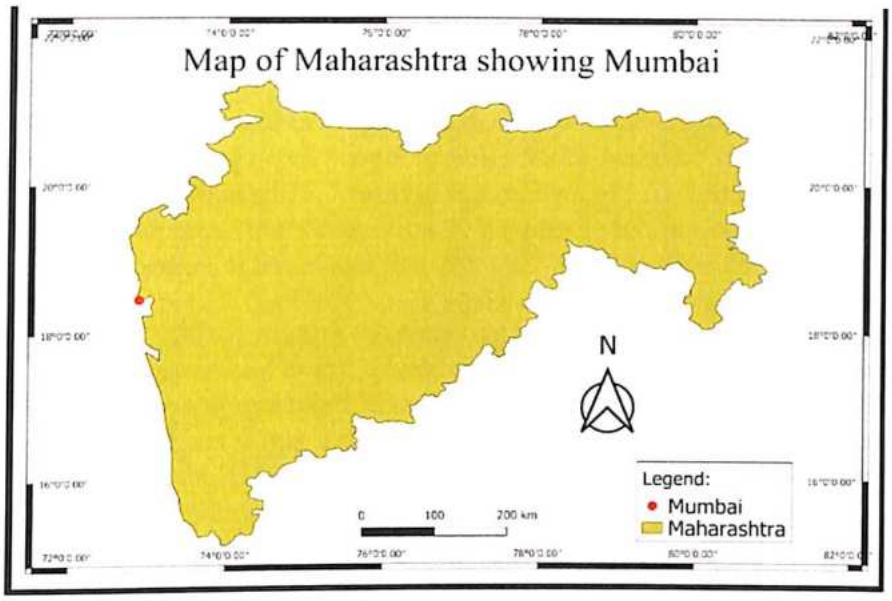

Figure 2.2.1: Location of Mumbai in Maharashtra

2.3 Importance of Fisheries Worldwide

Fishing activity is also carried out globally, which gives rise to an increase in the economy. Most of the fish and its products are traded. In 2018, 67 million tons of fish were supplied globally, to which the amount was USD 164 billion. Because of COVID – 19, the trade had hit down. It has created a huge effect on the global economy. It is hoping to have an increase in world fish production, but the growth rate may still remain low. So, it is looking forth to increasing the fish production from 179 million tons in 2018 to 204 in 2030. The amount, of fish produced globally in 2020 added up to 174.6 million metric tons and in 2010 the production was 148.1 million metric tons. Day by day fishing has become important because it is being consumed by almost all the people throughout the world.

Top Five Countries in the Production of Fish

Sr.no	Country	Million Tons
1	China	58.8
2	India	9.46
3	Indonesia	6.1
4	Peru	5.85
5	U.S	5.36

Table 2.3.1 -Top five countries in the world in the production of fish

Source: https://komira.co.id/site/article/read/882/20/5-Countries-with-the-Worlds-Largest-Fish-Yield

2.4 Fishing in India

India is surrounded by the coastline in the west, south, and east. India has a coastal line of 7516.6km. So fishing is considered one of the main occupations of India. Fishing has provided occupation to millions of unemployed people in India. India ranks 2nd globally in the production of fish. In 2018-19, India produced 13.7 million metric tons of fish. India has a coastline of about 8,000 km, so fishing is an important occupation of the people living near the coastal area. According to the 2010 census, it has stated that there are 3,288 marine fishing villages. 1511 marine fish landing centers in 9 maritime states, and two union territories. As per the data collected in the year 2013-2014, Andhra Pradesh stands first in the production of fish. The government of India has combined many schemes together under one scheme known as 'Blue Revolution: Integrated Development and Management of Fisheries.' As per the 2010 census, thedata collected by CMRI states that the total population involved in fishing was about 4 million which consisted of 864,550 families. On 20th May 2020, the Cabinet-minister gave the consent for Pradhan Mantri Matsya Sampada Yojana (PMMSY) by contributing Rs 20,050 crores for the fisheries. This PMMSY was been started by the Prime Minister on 10th September 2020.

Fishing being an important occupation of our country, plays a very important role in building up the socio-economic growth of our country. It has become one of the important employment opportunities for the illiterate and backward people of our country.Fish has become an integral part of the diet of the people residing in Kerala, West Bengal, Karnataka, Maharashtra, Andhra Pradesh, Tamil Nadu, Gao, and Gujarat because they are located near the coastal area. India carries out two different types of fishing they are, Marine fisheries and Inland fisheries. Marine fisheries include a fishing activity that is carried out near coastal areas, off-shore, and on the continental shelf. Inland fisheries include the catch from rivers, lakes, canals, reservoirs, ponds, tanks, etc., which is also called freshwater fishing.

Top five fisheries states in India in 2017-18(in lakh tonnes)

States	Inland	Marine	Total
Andhra Pradesh	28.45	6.05	34.5
West Bengal	15.57	1.85	17.42
Gujarat	1.34	7.01	8.35
Kerala	5.34	1.51	6.85
Tamil Nadu	1.85	4.97	6.82
All India production	89.02	35.88	125.9

Table 2.4.1 - Table of Top Five Fisheries in India

Source : https://www.google.com/search?q=top+five+fisheries+states+in+india+in+2017-18(in+lakh+tonnes)&sxsrf=APqWBuOQximmExT30xhclcUQnH462000g:1649936313186&source=lnms&tbm=isch&sa=X&ved=2ahUKEwjEveXeu5P3AhUGldgFHSPeDIkQ_AUoAnoECAEQBA&biw=1366&bih=657&dpr=1#imgrc=0JXtRzC1EFYcMM

The trend in the export of marine products

Year	In ₹ cr
2011 – 12	16,597.23
2012 – 13	18,856.26
2013 – 14	30,213.26
2014 – 15	33,441.61
2015 – 16	30,420.83
2016 – 17	37,870.90
2017 – 18	45,106.89

Table 2.4.1 -Trends in the Export of Marine Products

Source: : https://www.google.com/search?q=top+five+fisheries+states+in+india+in+2017-18(in+lakh+tonnes)&sxsrf=APq-WBuOQximmExT30xhclcUQnH462000g:1649936313186&source=lnms&tbm=isch&sa=X&ved=2ahUKEwjEveXeu5P3AhUGldgFHSPeDIkQ_AUoAnoECAEQBA&biw=1366&bih=657&dpr=1#imgrc=0JXtRzC1EFYcMM

2.4.3 Export of marine products in rupee crore

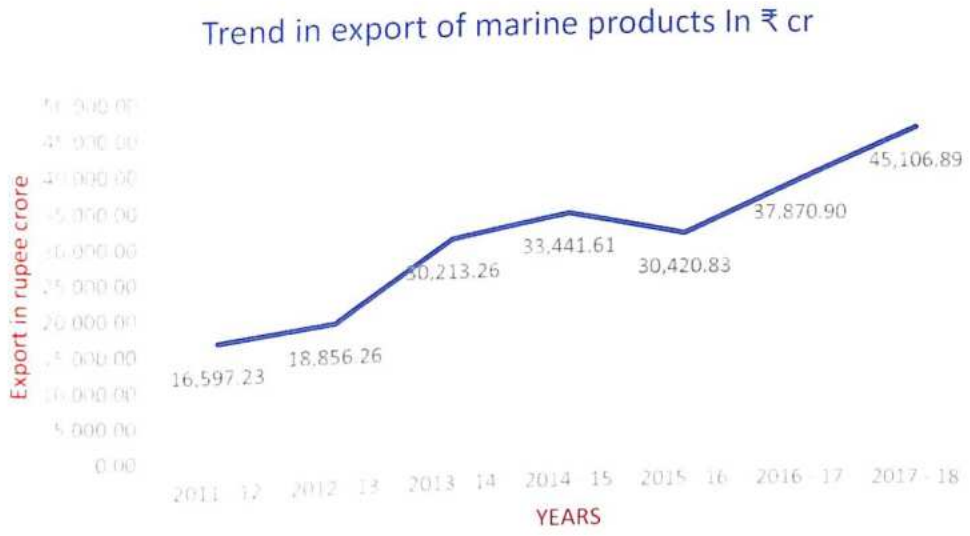

Figure 2.4.1 - Export of marine products in rupee crore

Source: Atlas

2.5 Location of Versova

The latitude of Versova, Mumbai is located at 19°7'60N and the longitude is 72°47'60E and the coordinates are 19.135094 and 72.813423. It is called a small town that belongs to the part of Andheri West of Mumbai in Maharashtra, India. The GPS coordinates of Versova are 19° 8' 6.3384" N and 72° 48' 48.3228" E. It is located near the ocean shore and has many houses. Versova is a place of local people, with some cafes and hotels recently.

Location of Versova	
Latitude	19°7'60N
Longitude	72°47'60E
Coordinates	19.135094 and 72.813423
GPS Coordinates	72° 48' 48.3228" E

Table 2.5.1 - Location of Versova

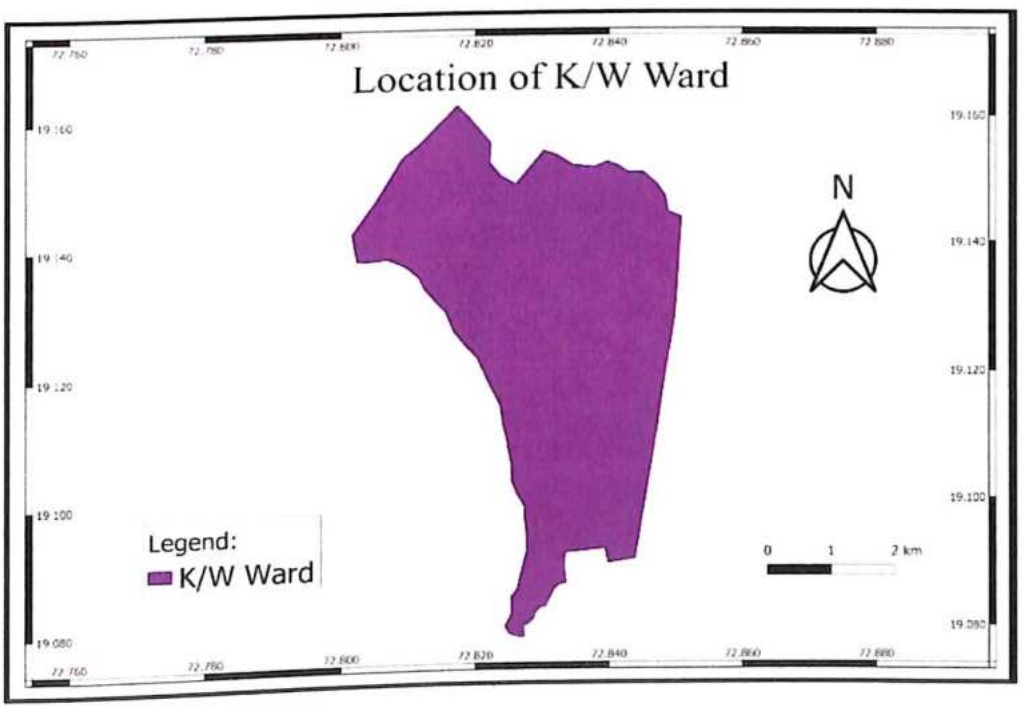

Figure 2.5.2 - Location of Versova – Study area

2.6 Historical Background of Study Area

Versova is well known for its beach and fort. It was known for its small fishing village known as Kolis. This village was named after "Vesave" which is obtained from the Marathi word which means "rest". In the year 1694, a group of Arabs from Muscat arrived at Versova and they started killing people whom they came across in the village. Versova village is made known in the document of Gamelli Careri in 1695.

During the medieval period, when the Portuguese ruled in India, they had built Our Lady of Health Church in Versova, where many of the Kolis were transformed to Christianity. In 1720, this village had formed into small towns which had a port where dry fish trading was carried out. In 1739 when the Marathas came into power, the Portuguese, later on, lost their rule to the Marathas. The British army, who were guided by Lieutenant-Colonel Henry Keating defeated the Marathas in 1774.

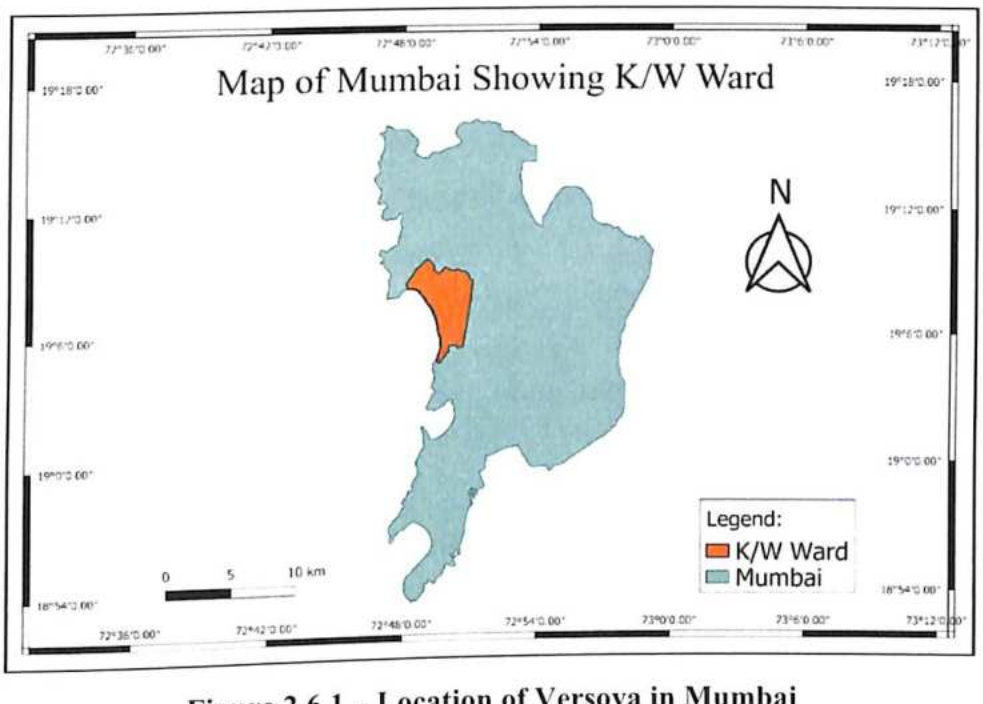

Figure 2.6.1 – Location of Versova in Mumbai

Versova village is comprised of the Koli community where about 3000 people are practicing fishing. It is also called one of the richest Koli Wada in Mumbai. Along with the fishing activity they even own their own ice factory to preserve the fish. Though fishing is carried out by males, almost 80% of the women are involved in selling the fish in the market. They have two areas of market one is to sell fish which is known as a formal market and the second one is to sell fish in an auction. The leftover fish is being sent to the fish food processing companies. Mangroves are surrounded along the side of Versova creek because of which crabs and mollusks are available. The fish which is brought by the boats are sold at a wholesale price. Some of the fish is kept for drying and later on, they are being sold in the market.

Plate 2.6.1- A place to dry fish and selling of fish in the market

Source: Photo taken from mobile

2.7 Culture

To mark the beginning of the new fishing season they celebrate this day as 'Narali Punav'. As per the government, Narali Punav is said to be celebrated on 1st August, but the fisherfolk mostly celebrates it on 15th August. The word Narali means 'coconut' and Punav means 'full moon day' They offer prayer to the sea god. This festival is celebrated by the whole fishing community as the beginning of the new producing season and the end of the monsoon in Maharashtra. It is believed that after this festival the strength of the wind and other changes in the sea be in their favor and to protect them from all incidents. During these days they treat their boats as sacred by decorating them with beautiful flowers, purchasing new boats and nets, and repairing their old boats before the festival. On the day of the festival, they prepare some traditional food which is prepared with coconut and rice. All the fisherfolk consider the sea as sacred because for them it is the only means of livelihood. They even plant trees on that day as a sign of love towards the environment. Currently the Versova fishing community has also started celebrating seafood festivals on Friday Saturday, and Sunday in the month of January where they exhibit their lifestyle and tradition to other parts of the city where they come dressed up in their traditional Koli outfits. At the time of this festival different types of fish and crabs are being cooked in their traditional Koli style and are being sold in almost 50 - 60 stalls. People from different parts of Mumbai visit Versova during these days to take part in the seafood festival. This festival helps them to increase the cost of their fish.

2.8 Settlement

Extremely clustered types of settlements are observed in the region. Most of the houses are now developed into bungalows and some have one plus two to three-floor buildings. They have well

spacious rooms and are well decorated. In some of the houses, the walls were observed to be made of bricks and cement, roofs of tiles and thatches. Earlier all the olden houses had carvings of the fish or the women carrying fish in their baskets done on the outer walls of the house or before the entrance of the house as a sign of Koli tradition. But as they turned their bungalow into buildings only some of the houses have carvings of fish done on the outer side of the walls. They even have Tulsi plant in front of their house to remove the evil energy from the house and as a sign of purity.

2.9 Sanitation

Due to the water current, present in the water, the debris gets collected in the coastal area. During the rainy season mass amount of plastic waste gathers on the coast. Due to the rapid development taking place in the city, many industries have come up, and with this industrial waste the water has got polluted and as a result decline in cross-breeding can be seen. Because of the utmost pollution, it disturbs the local people.

Every day the trash gets collected on the coastal and also in the surrounding area where the Koli people are residing. But the garbage which gets collected near the coastal region is being taken by the Brihanmumbai Municipal Corporation (BMC) every morning and sometimes even in the evening without fail. The region where people reside is also being kept clean. Along with the BMC, even the local residents try to maintain cleanliness in their area.

2.10 Development

The development has taken place for more than 8 years and it has affected the fisherfolk. The water near the coastal areas has been polluted. Industrial waste is also let in the sea, even the garbage is dumped in the seawater because of the less availability of land. This gives rise to mosquitoes breeding in the surrounding areas, which is not safe for the people residing. During the times of monsoon, the water level rises up causing all the debris to float up in the water and even it comes on the land.

2.11 Traveling modes

Andheri is the nearby station to Versova village. From Andheri railway station it is essential toapproach by bus or by metro to reach Versova Koli Wada within a few minutes. The use of the metro started in the year 2014, which has made it easier, and more convenient to move from Andheri station to Versova. Auto rickshaw facility is also available to the passengers to reach the Koli Wada region. The buses which offer services from Andheri station, west to Versova are bus numbers 221, 249, and 251.

2.12 Conclusion

This chapter is the introduction about the fisherfolk of the Versova Koli Wada region which is in Mumbai. It explains the fishing community and their livelihood. It also gives us information about the worldwide fishing and fishing in India. The following chapter deals with the study area, its location, and the historical background when it became free from the Portuguese rule and the rule was given to the Marathas. The top five states which are good in fisheries are also mentioned. This chapter also explains the culture of Versova fisherfolk their traditional attire and

their important festivals. It provides information about the types of settlements, their sanitation problem, how they get help from the government, and so on. This chapter explains the development taken from the last few years and their effect. It also gives us information about the modes of transport which can be used to reach Versova village.

The following chapter deal with the physiography of the study area where the study would be conducted.

CHAPTER 3

PHYSIOGRAPHY OF VERSOVA VILLAGE

3.1 Introduction

Physiography is a type of landform found in an area or a region. Physiography includes the types of landforms, mountains, rocks, soil, vegetation, the climate of a region, and its evolutionary history. The word physiography was started in1869 by Huxley to learn in detail about the earth's 'natural phenomena in general' then it was known as the study of landform of the earth's surface, water, and land.

3.2 Climate

Versova Koli Wada region lies in the equatorial region and so it has a tropical climate. Versova receives very less rainfall in the winter. This location is grouped as Aw by Koppen and Geiger. Versova Koli Wada area's average annual temperature is 26.6° C and 80.0° F. Almost 1685 mm of precipitation falls every year. March is considered one of the driest months with 0 mm precipitation and July has more precipitation with an average of 552 mm. the average temperature is 29.2 C and January has the lowest average which is about 23.8 C throughout the year.

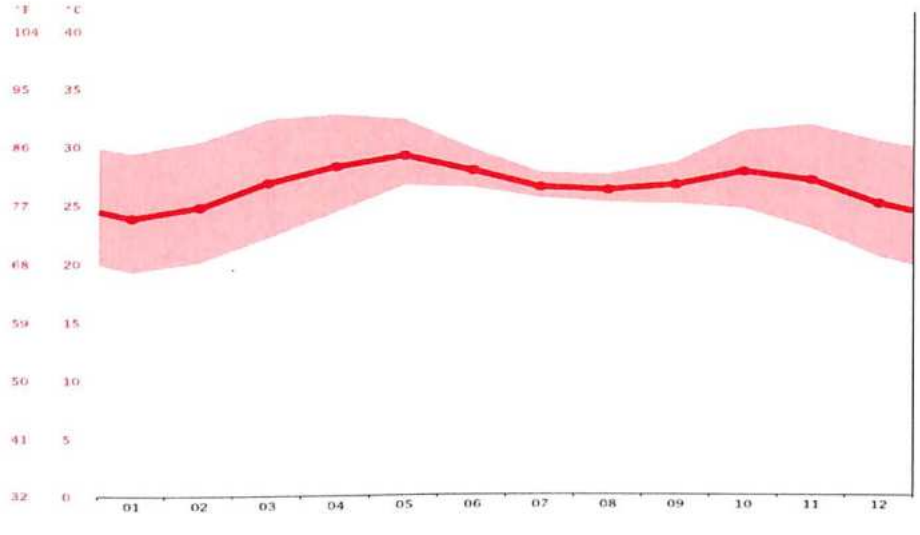

Figure 3.2.1 - Average Temperature – Versova Koli Wada

Source - https://en.climate-data.org/asia/india/maharashtra/versova-koliwada-707510/#:~:text=Versova%20Koliwada%20has%20a%20tropical.%C2%B0F%20in%20Versova%20Koliwada.

During the driest and the wettest month, the average precipitation is552 mm. July has the highest relative humidity of around 89.07% and January has the lowest relative humidity of about 57.87%. July receives the highest annual rainfall and March receives the lowest number of annual rainfall. January, February, March, April, October, November, and December are good months to visit Versova Koli Wada.

Versova Koli Wada is surrounded by the Arabian sea and its annual average temperature is around 27,70°C. June has the highest water temperature with an average of 30.20°C and January has the lowest water temperature of about 24.80°C.

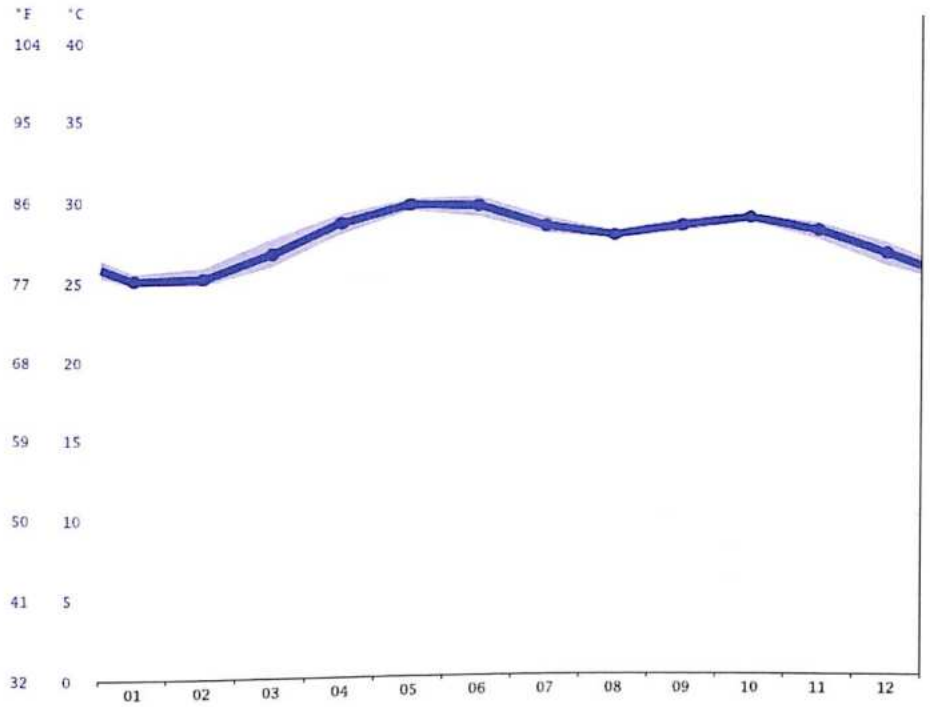

Figure 3.2.1 - Arabian Sea Water Temperature – Versova Koli Wada

Source - https://en.climate-data.org/asia/india/maharashtra/versova-koliwada-707510/#:~:text=Versova%20Koliwada%20has%20a%20tropical,%C2%B0F%20in%20Versova%20Koliwada.

3.3 Soil

Versova Koli Wada has a coastal area. It is also famous for Versova beach and Versova Rock beach. These two beaches give a panoramic view of the golden sunset. Versova has sandy soil on

the beach. Versova, a fishing village is connected to Madh Island with a Jetty. Black soil is found near the jetty, even the water is blackish in color because of pollution. Red soil is found on the surface of the ground.

3.4 Drainage

Versova fishing village faces a poor drainage system. Those people who are residing near to this area are going through sanitation problems. The reason for poor drainage is the garbage that is being dumped in the water and also because of the debris which is left in the water. During the time of monsoon, all this plastic waste start floating in the water, which affects fishing. The Goregaon Nala flows towards the Koli Wada, which carries garbage along with it and this produces a bad smell in the nearby village. Megara Nallah and Malad creek is also connected to Versova creek. There are many other streams such as Goregaon, Oshiwara, and Amboli also join the Versova creek, and further, it joins the sea at Juhu. The village people are taking a lot of initiative to reduce the waste which is collected on the coast side. The waste which is obtained from the fish is used as manure.

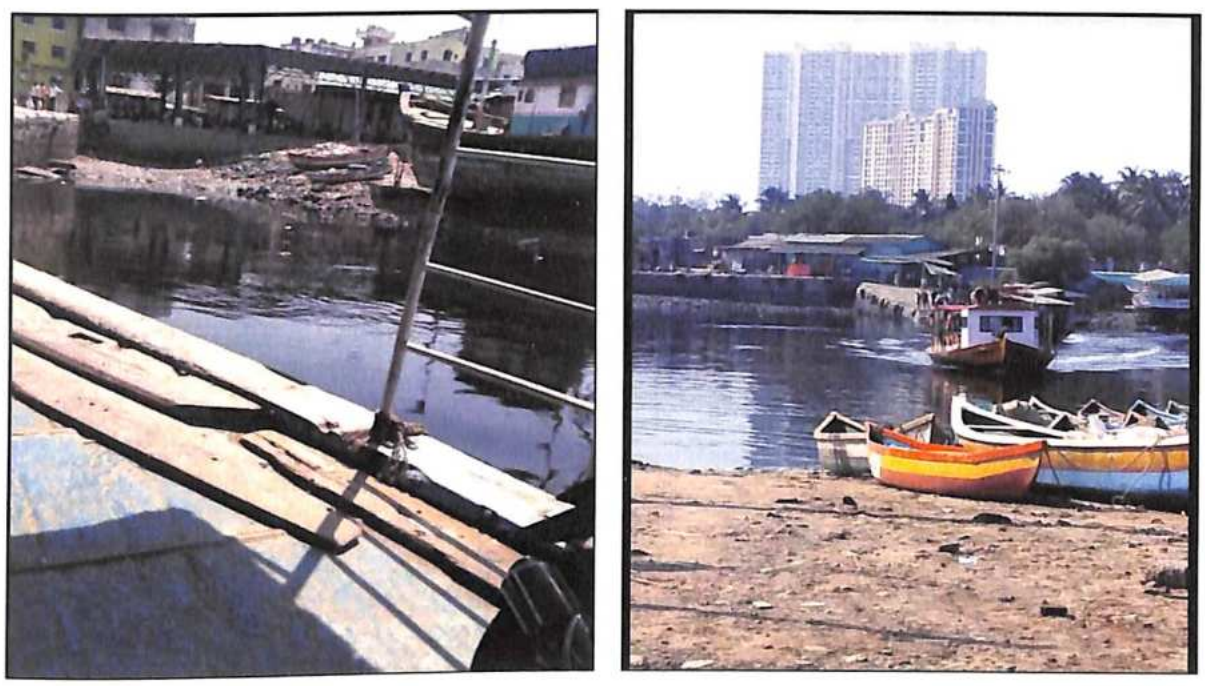

Plate 3.4.1- Versova creek connected to Madh Island

Source – Photo taken from mobile

3.5 Madh Fort

Madh Fort is situated at Madh Island which is near Aksa Beach which is in northern Mumbai. It is away

from the mainland and is surrounded by the sea. Madh fort is built based on the European model. Madh Fort is also known as Versova Fort. It is built near the Kileshwar Mahadev temple, on Madh Island. The walls of the fort have a firing place. It was built by the Portuguese during the 17th century and was used as a watchtower to see the neighboring places. This base of the fort is strong so that it can face the tides and erosions. It is a long fort and it is very narrow with a seven-sided polygonal structure. This fort is also surrounded by some green vegetation which adds beauty to this place. This fort was captured by the Marathas in 1739 CE during the time of war. Due to being far away from the mainland, it was difficult to visit that place. This fort became the place of trade center which is connected to many other ports which is located in Mumbai. From Madh fort one can take a view of Gorai, Worli, and the Mumbai Beach skyline. This fort has been used by most Bollywood movies for shooting. Madh fort is under invigilation of the Indian Air Force and Navy. If one wants to visit the Madh fort they have to seek permission from the concerned authorities.

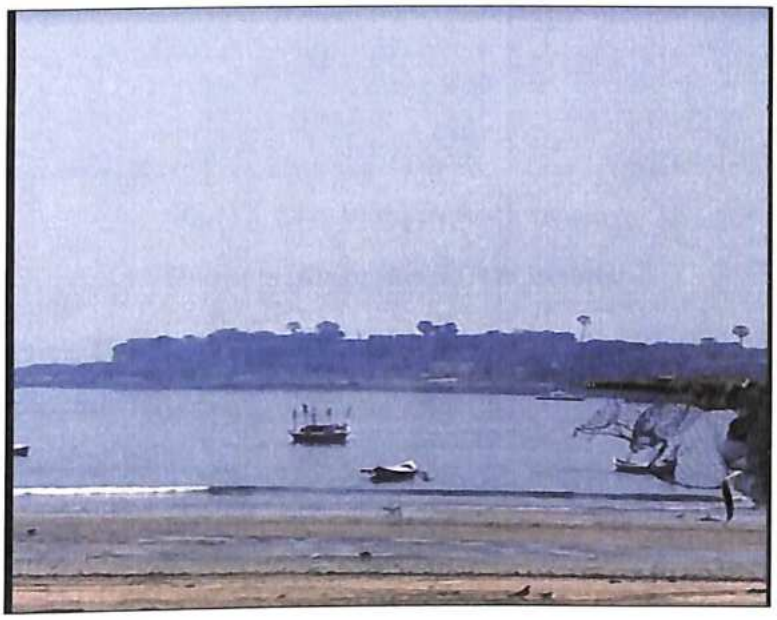

Plate 3.5.1- Image of Madh fort

Source: Photo taken from mobile

3.6 Vegetation

Mangroves play an important role in helping the production of fish and fauna as the place provides food for both. Because of urbanization only some part of Versova is covered up with mangroves. But now one gets to see many plastics and debris being dumped in this area. Mangroves act as a shield between the sea and the coast fighting against the tide.

3.7 Versova Rocky Beach

Versova Rock beach is a small beach which is facing the Arabian Sea. This beach has black white sand with few rocks. This rocky beach was recommended by Shivaji Maharaj for relaxation whenever he felt exhausted and required rest. The special about this beach is it is well known as the fishing beach of Mumbai. This beach is connected to Versova creek and because of

the polluted water, even the seawater near Rocky beach is little black in color. Tetra-Pods and basalt rocks are found on this beach. They give protection from waves hitting the shore which can cause destruction. Horse riding, boat riding, and cycling are some of the activities practiced on this beach.

Plate 3.7.1 – Versova Rock Beach

Source – Image taken from mobile

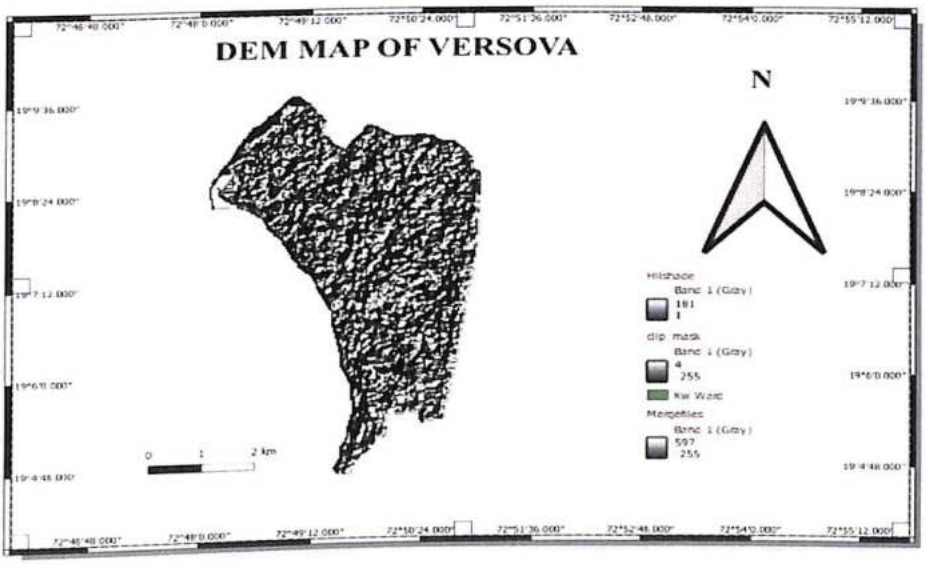

Figure 3.7.1 – Demographic map of Versova showing the elevation

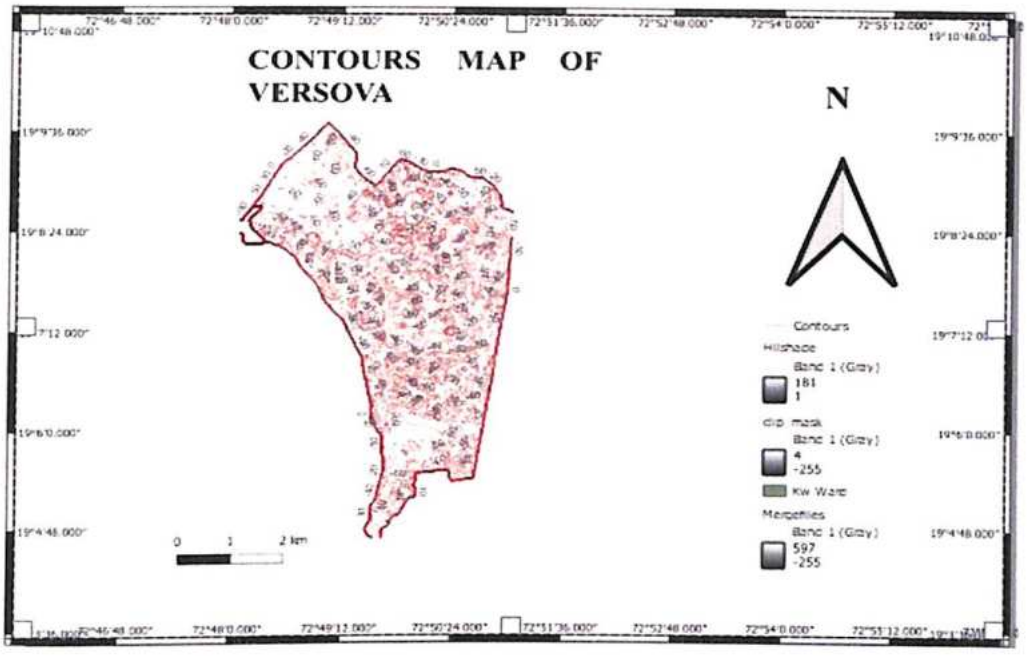

Figure 3.7.2 – Contours map of Versova

3.8 Conclusion

This chapter is about the physiography of the Versova Koli Wada region which is located in Mumbai. It explains the landforms of the Versova region. It gives us information about the type of climate and the average rainfall the area receives every year. The following chapter also deals with the study of the water temperature of the Arabian sea, type of soil, and vegetation. This chapter also provides information about Versova Rocky beach and its importance. It also gives information on Madh fort which is also known as Versova fort which was being built by the Britishers during the 17th century.

The following chapter deals with the Socio-economic aspects of the Versova fishing community where the survey was conducted to collect primary data from the respondents.

CHAPTER 4

SOCIO-ECONOMIC ASPECTS OF VERSOVA KOLI WADA

4.1 Introduction

The word socio-economic means the interactivity between the social and economic activity of the people. The word socio means the study of the behavior of the people their way of living or their interaction with the people and their family. The word economic means finance which means the people's earnings or wages. Therefore, socio-economic means income and the social problems of the community.

4.2 Table of the Survey with date and remarks

Sr. no	Date of Survey	No. of Respondents	Remarks
1	02-03-22	10	Respondents were cooperative during the survey
2	03-03-22	7	Respondents were hesitating
3	05-03-22	5	Respondents were cooperative during the survey
4	08-03-22	20	Respondents were cooperative during the survey
5	12-03-22	20	Respondents were hesitating
6	13-03-22	25	Respondents were cooperative during the survey
7	15-03-22	13	Respondents were cooperative during the survey

4.3 Research objectives

- To study the life of the people of the fishing community.
- To know the problems faced by the fishing community.
- To understand the sanitation problem of Versova village
- To know the settlements of the fishing community.
- To study the development taking place in the Versova village and their impact on the fishing activity.
- To understand the socio-economic factors of the fishing community.

4.4 Research methodology

Figure 4.4.1 – Research methodology

a. Pre field phase

The present study was conducted in the fishing community of Versova village in Mumbai. Data was collected from secondary sources such as articles, various online journals, etc. Apart from this, images in the data table have been referred to from online sources. A well-structured questionnaire was prepared using Google forms for collecting primary data. The sample size was decided by 100 samples.

b. On-field

The field survey was conducted in the fishing community of Versova village of Mumbai. Several visits were made to the site to collect data from the respondents. A random sampling method was adopted to collect the data. The respondents were asked questions in a well-structured Google form. 100 samples were surveyed in the month of March 2022.

c. Post field

The collected data from the respondents was segregated, stored, tabulated, accessed, and analyzed. Maps have been prepared using GIS for a better representation of the conclusion. Limitations have been identified and the result was interpreted and a suitable recommendation is given.

4.5 Questionnaire of the Study

- **Gender:**

Sr.no	Gender	Number of Respondents
1	Male	78
2	Female	22

Table: 4.5.1 Gender of the Respondents

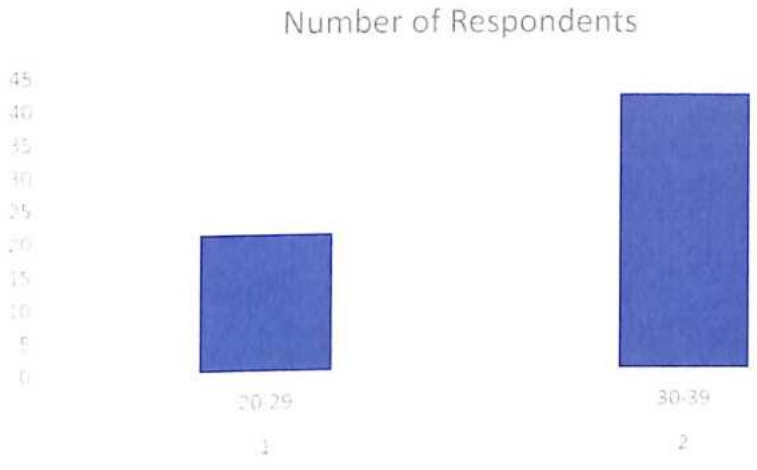

Figure:4.5.1Graph representing the gender of the respondents

The graph shows the total number of people who were surveyed was 100. Out of which 22 were female respondents and 78 were male respondents. This shows that most of the male respondents have included themselves in catching fish. Whereas women have engaged themselves in marketing.

- **Age**

Sr.no	Age	Number of Respondents
1	20-29	21
2	30-39	42
3	40 and above	37

Table 4.5.2: Age of the respondents

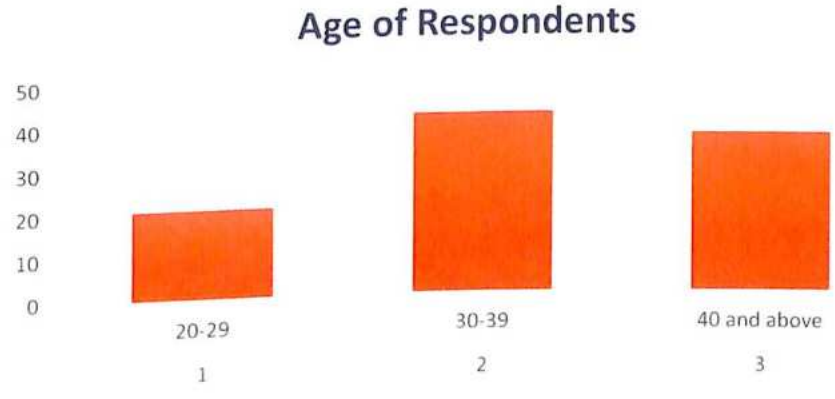

Figure 4.5.2: Graph representing age of the respondents

The above graph shows the number of people surveyed was 100. They were again been sub-divided as per their age category. The total number of people who were from the age group of 20-29 was about 21 people. The people from the age group of 30-39 were about 42 and the respondents from the age group of 40 years and above were about 37 people. This shows that people belonging to the age group of 30 and above are more who have engaged in fishing activity. Whereas people from 20-29 are very less. It can be because the new generation of today's youth wants to work in the companies.

- **Numbers of years engaged in fishing activity**

Sr.no	Number of years engaged in fishing activity	Number of respondents
1	Less than 5 years	35
2	10 – 15 years	28
3	More than 15 years	37

Table 4.5.3: Number of years respondents engaged in fishing activity

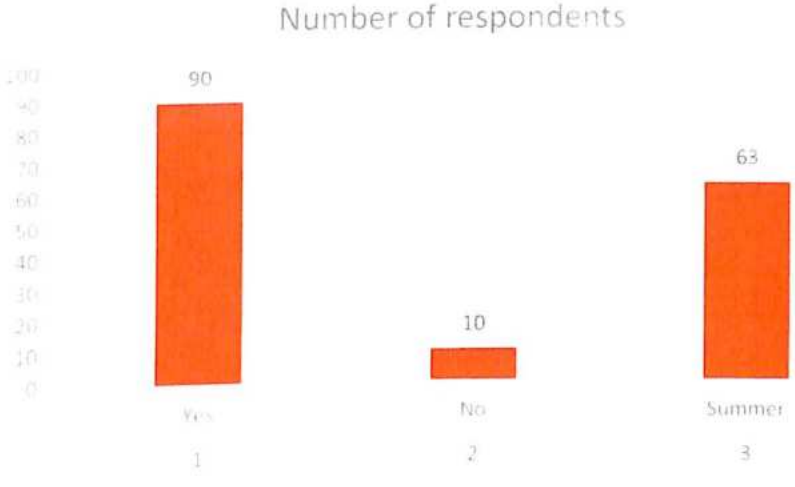

Figure 4.5.3: Graph representing number of years respondents engaged in fishing activity

The above graph shows the number of respondents from how many years they were engaged in fishing activity. Out of 100 respondents, since less than 5 years, only 35 people were practicing the fishing occupation, 10 – 15 years only 28 people practice fishing occupation and followed by more than 15 years the number of people was 37. However, this is just a random occurrence.

4.5.4 Number of time fishing carried on

Sr.no	Number of times fishing activity carried on	Number of respondents
1	Daily	36
2	Alternate days	39
3	More than 3 days	25

Table 4.5.4 Number of time fishing carried on by the respondents

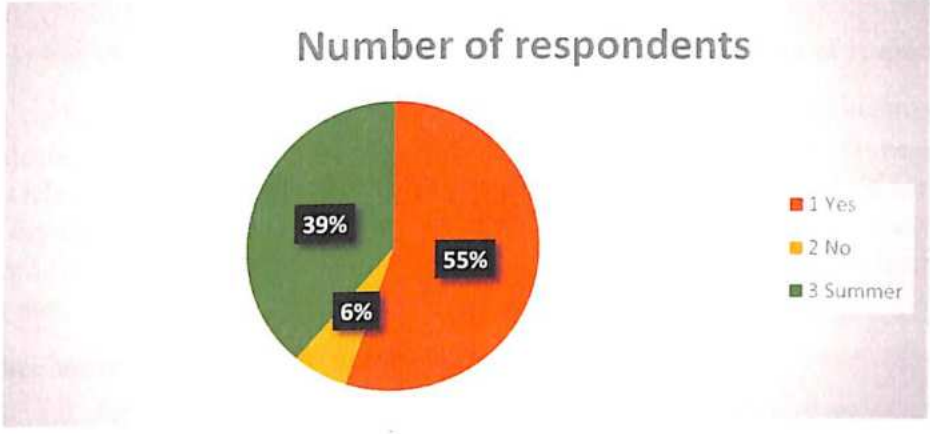

Figure 4.5.4: Pie-chart representing number of time fishing carried on by the respondents

The above pie chart gives us information about the number of times people carried on fishing activity. Out of 100 respondents, the total number of people who carried out fishing daily was 36%, followed by 39% people alternate days and 25% of people practiced fishing for more than 3days. This shows that the people practicing fishing daily and alternate days are more than 3 days.

- **Is fishing the only source of income**

Sr.no	Is fishing the only source of income	Number of respondents
1	Yes	78
2	No	22

Table 4.5.5: Is fishing the only source of income of respondents

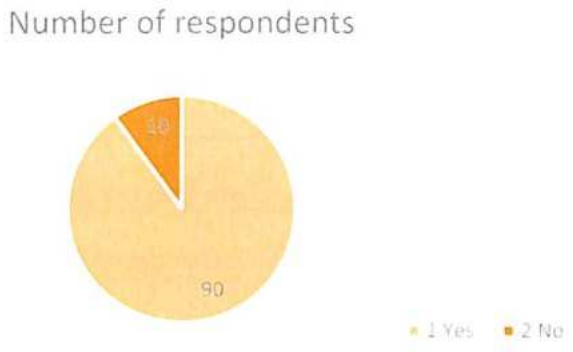

Figure 4.5.5: Pie-chart representing is fishing the only source of income of respondents

The above pie chart shows the respondents whose fishing is the only source of income. Out of 100 respondents, 78 people are completely dependent on fishing as their only source of income, even if their whole family is involved in fishing activity. The remaining 22 people are not completely dependent on fishing as their only source of income. The people who are not dependent only on fishing indicate that they are running some small stalls to earn their livelihood and to meet their ends.

- **Other source of income**

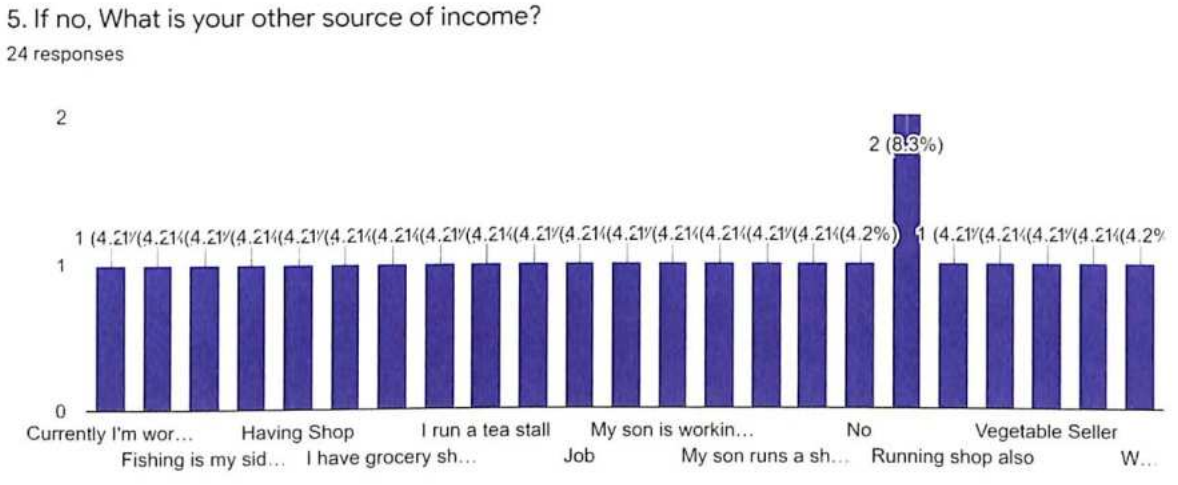

Figure 4.5.6: Graph representing other source of income of the respondents

The above graph shows the number of respondents whose fishing is not the only source of income. Out of 100 respondents, 23 people are not completely dependent on fishing to earn their livelihood. Some of the people who practice fishing also run their tea stalls, some have their grocery shop, and vegetable shop and some of their sons are working in the corporate office.

This shows that some fishermen don't want their children to continue with the same occupation because they face many problems when they go fishing.

- **Area of fishing**

Sr.no	Fishing carried out	Number of respondents
1	Mostly freshwater	58
2	Mostly saltwater	18
3	Both	24

Table 4.5.6: Area where is fishing carried out

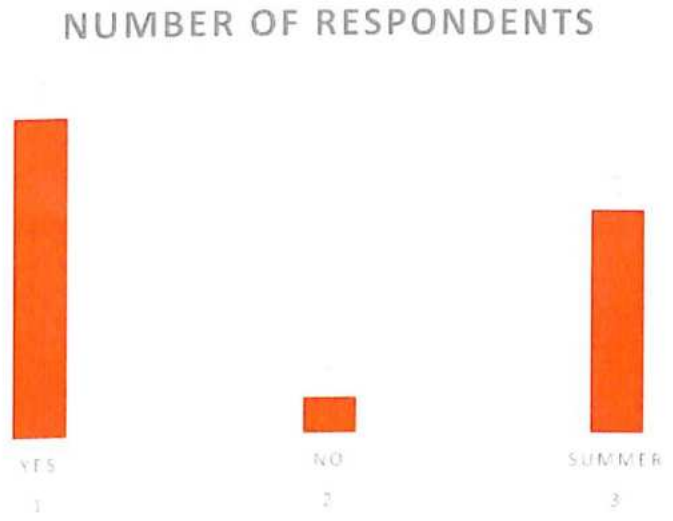

Figure 4.5.7: Graph showing area where fishing activity carried out

The above graph shows the number of respondents who practice fishing in which water. Out of 100 respondents, 58 people carry out fishing in the freshwater, followed by 18 people who prefer to practice fishing mostly in the saltwater and 24 people prefer carrying out fishing in both areas. Respondents prefer to go freshwater fishing because fishing in the creek has become difficult because of pollution. There are many other creeks connected to it, so along with the water, the industrial waste which is dumped in the water flows with it. Because of it, the fishermen are not able to see the fish in the water and even the fish are trying to move out to place where they find safe.

- **Distance covered while fishing**

Sr.no	Distance covered while fishing	Number of respondents
1	Less than 5 miles	15
2	More than 5 miles	40
3	Depend on season	45

Table 4.5.7: Distance covered while fishing

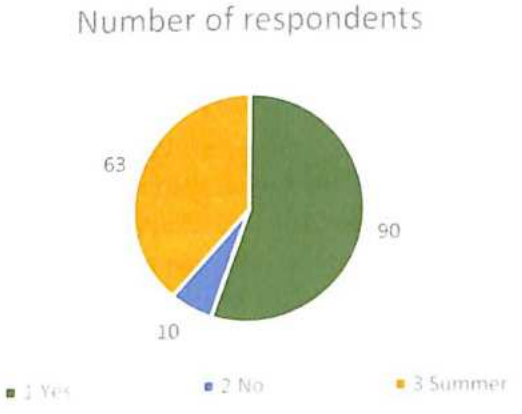

Figure 4.5.8: Pie-chart representing distance covered while fishing by the respondents

The pie chart shows the number of respondents and how far do they go to carry out fishing in their locality. Out of 100 respondents, 15 people carry out fishing less than 5 miles away, 40 people carry out fishing more than 5 miles away, and 45 people go fishing depending on the season and tide they take out their boats. Most of the fishermen said that they prefer to go fishing during the winter and summer seasons. Some said only some fishermen carry fishing during the rainy season. Some said that during the rainy season they find it difficult because of the speed of the wind which blows. They even stated they prefer going fishing after 15th August that is after Nariyal Purnima, to calm down the seawater. There are hardly some people who go fishing in their nearby areas because of pollution. They prefer going out miles away to get a good quantity of fish.

- **Problems faced by the people**

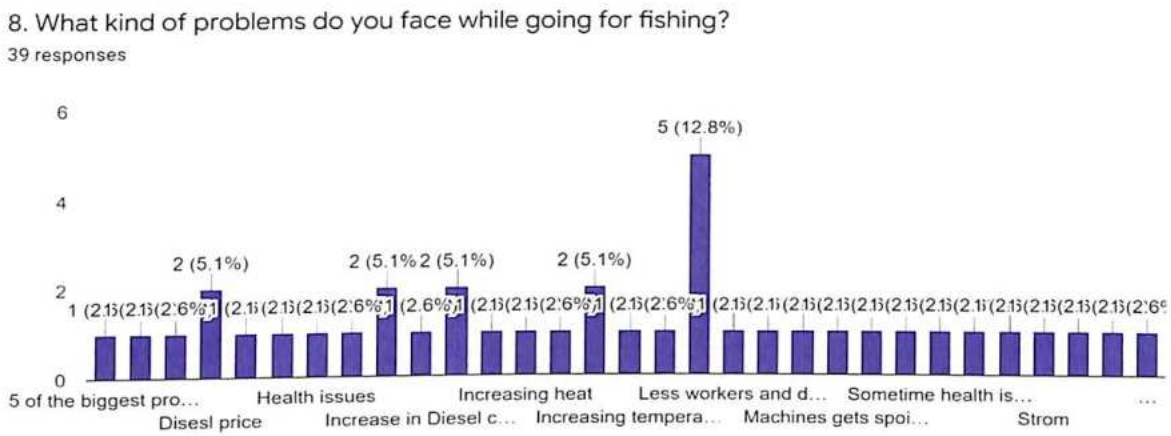

Figure 4.5.9: Graph showing problems faced by the people while going for fishing

The above graph shows problems faced by the respondents while they go fishing. Out of 100 respondents, most of the people said that they face problems like fewer workers, storms, increasing-price in diesel, increasing temperature, and health issues. Some respondents said after lockdown because of COVI-19 pandemic workers started becoming lesser. Some said they come across storms when they go fishing and even sometimes their boats get spoiled and they have to pull their boats and get back to the coastal area. They even mentioned the increasing price of diesel every year by the government. This shows that every new day the fishing community faces a number of challenges to fulfill their livelihood.

- **Types of boats**

Sr.no	Type of boats used for fishing	Number of respondents
1	Traditional boats	7
2	Mechanical boats	54
3	Both	39

Table 4.5.8: Types of boats used for fishing

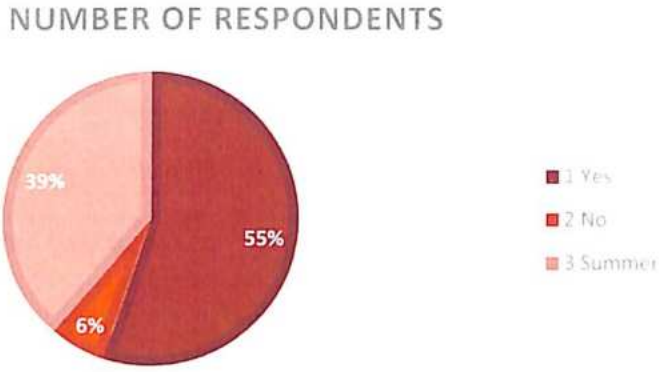

Figure 4.5.10: Pie-chart representing types of boats used for fishing

The pie chart shows the respondents using different types of boats for fishing. Out of 100, only 7 people make use of traditional boats, 54 people make use of mechanical boats and 39 people make use of both traditional as well as mechanical boats. This indicates that most people find it easy to make use of mechanical boats which is more convenient to get a good catch. Because of leakage, the fishermen make use of mechanical boats. The respondents said that earlier there were 250 mechanical boats were used and now there are only 80 mechanical boats used. They said that they make use of GPS and other wireless technology in the mechanical boats because it acts as an indicator to find the fish. They prefer the traditional method of fishing only when they carry fishing in the nearby areas.

Plate 4.5.1: – Boats used for fishing

Source – Photo taken from mobile

- **Ownership of their boats**

Sr.no	Owner of the Boats	Number of respondents
1	Yes	70
2	No	30

Table 4.5.9: Ownership of their boats

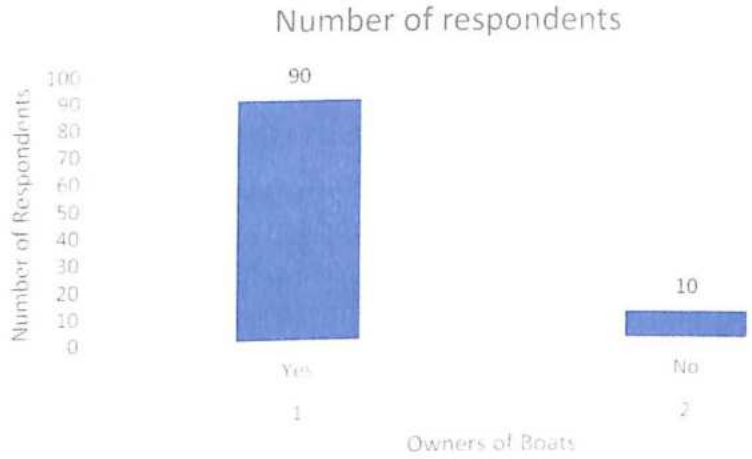

Figure 4.5.11 Graph representing respondents as the owner of their boats

The above graph shows the number of respondents who are the owner of their boats. Out of 100 respondents, 70 people are the owner of their own boats which they use for fishing, and 30 people are not owning their own boats. The people who are not owing their own boats are working under other fishermen as workers, who are being paid on daily basis or on a monthly basis through which they satisfy their needs.

- **GPS and Other technology**

Sr.no	Use of GPS and Other technology	Number of respondents
1	GPS	78
2	Other technology	22

Table 4.5.10: Use of GPS and Other technology

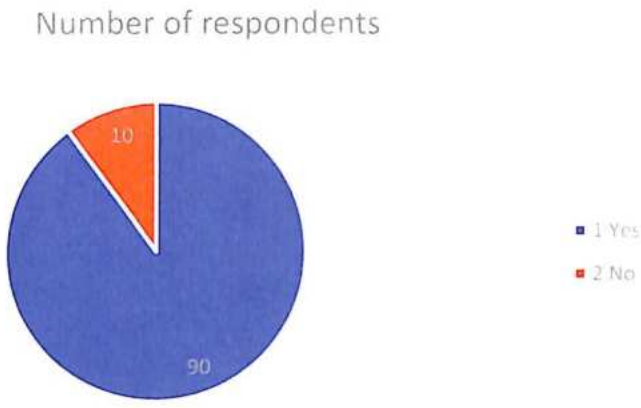

Figure 4.5.12: Pie-chart representing use of GPS and Other technology

The above pie chart shows the number of respondents making use of GPS and other technology in their boats when they go fishing. Out of 100 respondents, 78 people make use of GPS in their boats and 22 people make use of wireless technology in their boats when they go out fishing. Most people make use of GPS in their boats because it is cheaper than wireless technology. They said that the cost of GPS is within 60 thousand. Where else the cost of wireless technology is more than the GPS which comes to almost 1 lakh. They said that GPS technology is used is an American company and ICOM is the wireless technology which is a Japanese company.

- **Number of hours spent fishing**

Sr.no	Number of hours spent fishing	Number of respondents
1	2 hours	10
2	2 – 5 hours	48
3	More than 5 hours	42

Table 4.5.11: Number of hours spent fishing

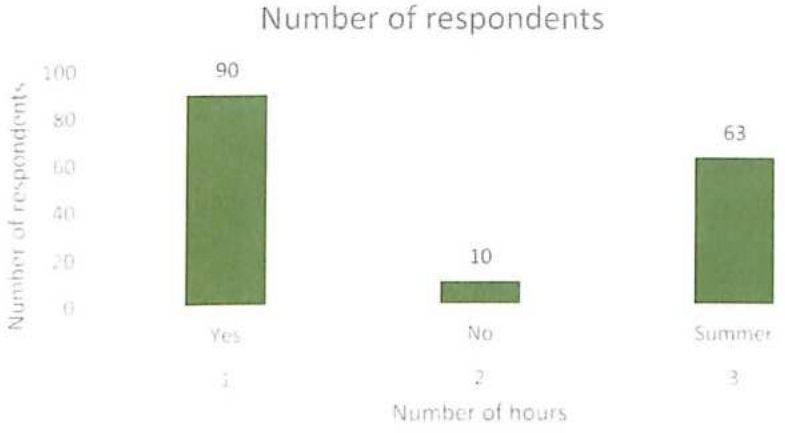

Figure 4.5.13: Graph representing number of hours spent fishing by respondents

The above graph gives us information about the number of hours spent by the respondents carrying out fishing. Out of 100 respondents, only 10 people spent only 2 hours in a day fishing followed by 48 people who spent, 2 – 5 hours in fishing, and 42 people spent more than 5 hours when they went fishing. This indicates that fishing takes lots of time. They said that when they go out more than 5 miles away, they spent more time fishing. They said that the more time they spend on fishing they get large the quantity of fish.

- **The best season for fishing**

Sr.no	Best season for fishing	Number of respondents
1	Raining	4
2	Winter	13
3	Summer	63
4	ALL the above	20

Table 4.5.12: The best season of the year for fishing

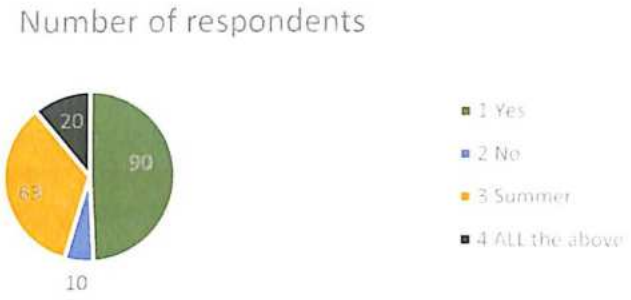

Figure 4.5.14: Pie-chart representing the best season of the year for fishing

Plate 4.5.2 – Types of fish

Source – Photo taken from mobile

The above pie chart gives the information about respondents which season they prefer as good to carry out fishing. Out of 100 respondents, only 4 people prefer to go fishing during the rainy season, 13 people prefer to go fishing during winter, 63 people prefer the summer season to go fishing and 20 people prefer all the three-season to go fishing. The data collected by the respondents shows that the summer and winter season is more beneficial to carry out fishing. They don't prefer the rainy season because of the rough weather, because of which they can't drop their nets in the sea. There are different types of fish caught depending on the season.

- **Celebration of Nariyal Purnima Festival**

Nariyal Purnima festival is celebrated on 15th August every year, after the celebration of this festival only the fishermen carry out the fishing activity. As per the government, it is allowed to go fishing from 1st August onwards. This festival is celebrated to offer prayer to the sea God by offering coconut in the sea. They repair their old boats before this festival and also decorate it with lots of flowers. They all dress up in their traditional clothes as it is a grand celebration. Every household prepares sweets that are specially prepared making use of coconut. It is believed that after offering prayers, God will protect them from natural disasters and will get a good catch.

- **Family members included in fishing activity**

Sr.no	Family members included in fishing	Number of respondents
1	Yes	85
2	No	15

Table 4.5.13: Family members included in fishing activity

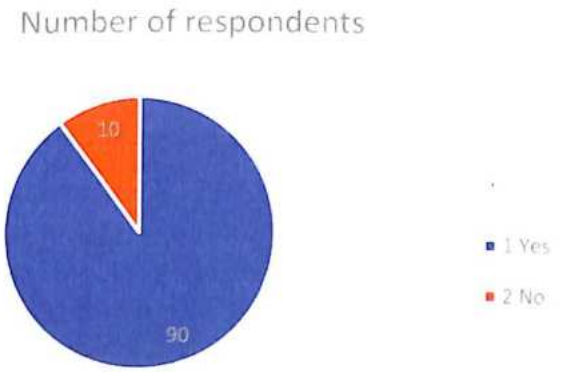

Figure 4.5.15: Chart representing respondents family members included in fishing activity

The above pie chart shows the number of respondents' family members involved in practicing fishing activity. Out of 100 respondents, 85 people's family members are practicing fishing and 15 people's family members are not practicing the fishing occupation. This is because there are possibilities for their family members to work in the office or else, they may be having their own business. Some respondents stated that because of urbanization the coastal area which was used for fishing has been reduced. The majority of the whole family are practicing fishing which

indicates fishing is the only source of income. Because they are completely dependent on fishing, even all their family members are into this practice.

- **Number of respondent's kids going to school**

Sr.no	School going kids	Number of respondents
1	Yes	57
2	No	43

Table 4.5.14: Number of respondent's kids going to school

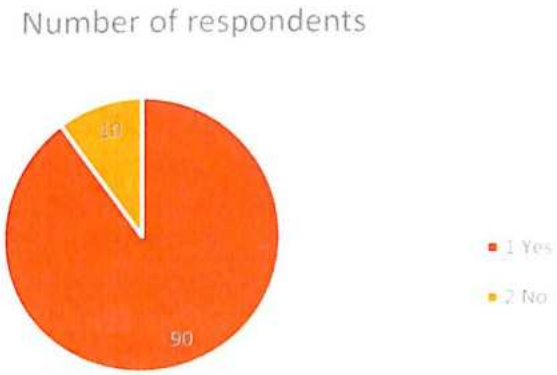

Figure 4.5.16: Pie-chart showing number of respondent's kids going to school

The pie chart gives information about the number of respondent's kids going to school. Out of 100, 57 respondents' kids are going to school and 43 respondents' kids are not going to school. This indicates that most of the respondents want to pursue higher education and they are interested in studying. Some of the fishermen don't want their kids to struggle in their life. Some, of their kids, have already completed their education and are working in the company.

- **Fishing skills taught to the kids**

Sr.no	Fishing skills taught to the kids	Number of respondents
1	Yes	45
2	No	55

Table 4.5.15: Fishing skills taught to the kids

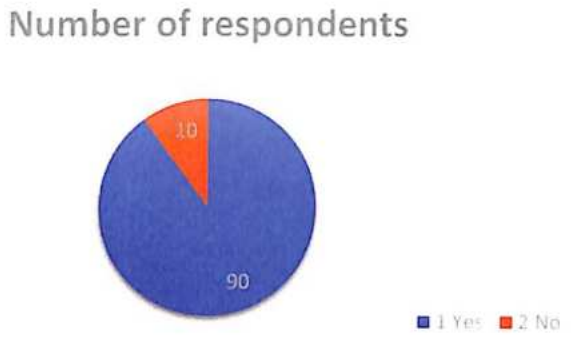

Figure 4.5.17: Pie-chart showing fishing skills taught by the respondents to their kids

The above pie chart shows the number of respondents kids who are taught the skills of fishing. Out of 100, 55 respondents' kids are not taught the technique of catching fish and 45 respondents, teach their kids the skill of fishing. The kids who are going to school are not taught the skill of fishing. Some fishermen said their kids come to the coastal areas only on Sunday as they go to school every day. The above response implies that there are some families, who want their kids to carry out the same occupation to meet their ends as they don't have any other source of income. They have even involved their children and their other members of their family in fishing.

- **Number of respondents face problems in the fishing community**

Sr.no	A number of respondents face problems in the fishing community	Number of respondents
1	Yes	20
2	No	80

Table 4.5.16: Number of respondents who face problems in the fishing community

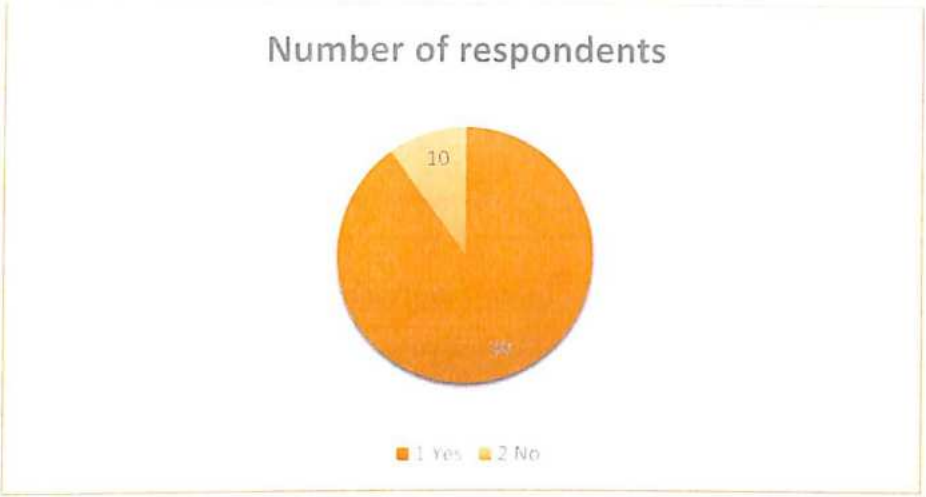

Figure 4.5.18: Pie-chart representing number of respondents face problems in the fishing community

The given pie chart gives information about the respondents who face problems in their fishing community. Out of 100, only 20 people face problems in the fishing community and 80 people do not face problems in their fishing community. The problems faced by the respondents in their fishing community are misunderstanding and space issues while carrying out fishing. Some respondents said that misunderstanding takes place in their community but they are been solved as early as possible so that they don't face problems during fishing. Few respondents face problems regarding space as to where to keep their fishing equipment.

- **Kinds of problems faced fishing community**

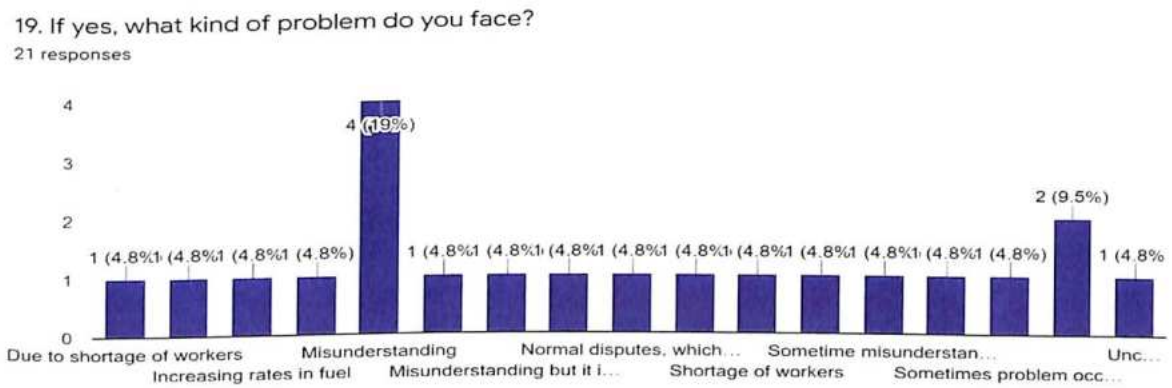

Figure 4.5.19: Graph representing kinds of problems faced in fishing community

The above graph shows us the different kinds of problems faced by the fishing community. There are a number of problems faced such as misunderstanding among the people, spacious issues. But they are solved immediately. Few respondents were facing problems like shortage of

workers and increasing price of diesel. They said that when they go far away for fishing, they need a lot of diesel which is used in mechanical boats. Some fishermen concluded that after COVID- 19 the number of workers also started reducing and even the charges have become more.

- **Equal participation of men and women**

Sr.no	Equal participation of men and women	Number of respondents
1	Yes	90
2	No	10

Table 4.5.17: Equal participation of men and women

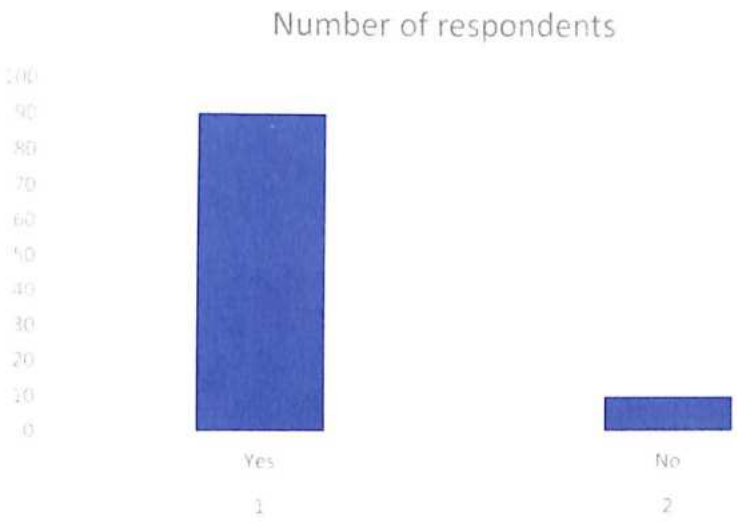

Figure 4.5.20: Graph representing equal participation of men and women

The graph shows the number of respondents who agree and disagrees that both men and women equally participate in carrying out fishing. Out of 100 respondents, 90 say that both men and women have engaged themselves in carrying out fishing. Only 20 people say that men and women do not participate equally in carrying out fishing. Most of the men carry out fishing and some sell the fish in the market. Where else most of the women are selling the fish in the market and only a few women go to obtain clams in the sea. Obtaining clam is done only during the low tide. So, from fishing to trading activity is being carried out by both men as well as women equally. Not only, fresh fish is sold in the market but even they sell dry fish in the market, which is also in demand by the consumers.

Plate 4.5.3 – Area from where fish taken to the market

Source – Photo taken from the mobile

- **Development of the area**

Sr.no	Development of the area	No. of Respondents
1	5 years	21
2	8 years	50
3	More than 10 years	29

Table 4.5.18: Development of the area

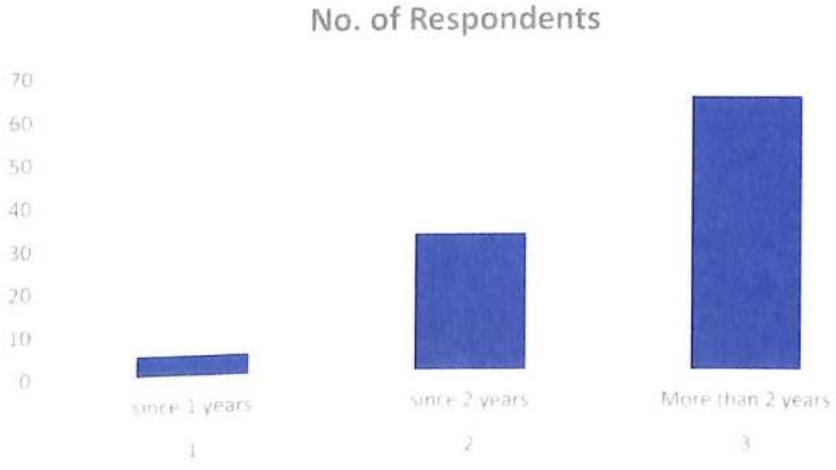

Figure 4.5.21: Graph representing the development of the area

The above graph shows the development which has taken place in the last few years. Out of 100 respondents, 21 people said that the development took place 5 years back, 50 people said development started from last 8 years back, and 29 people stated that development happened, 10 years back. This indicates that development takes place at a greater level. As the city has developed the fishing community has to undergo multiple challenges, from acquiring space to carrying out fishing. They even find the coastal areas have been reduced because of the construction of the roads.

- **Impact of development on fishing occupation**

Sr.no	Impact of development	No. of Respondents
1	Yes	77
2	No	23

Table 4.5.19: Impact of development on fishing occupation

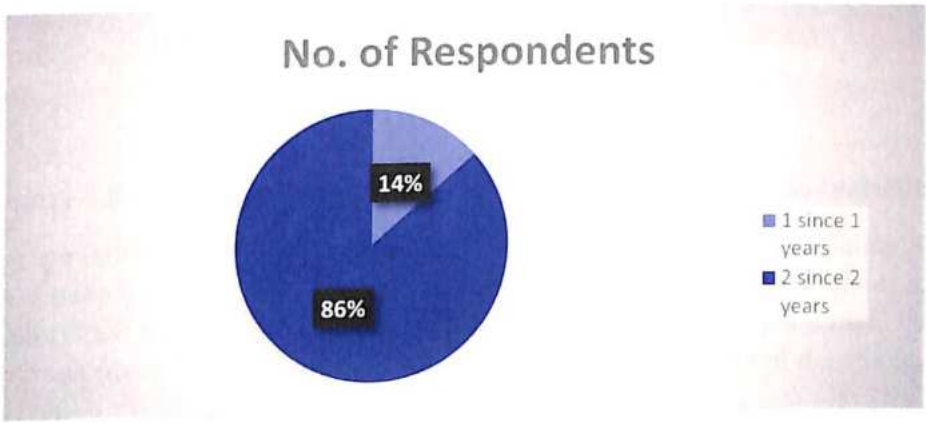

Figure 4.5.22: Pie-chart representing impact of development on fishing occupation

The above pie chart gives information on whether development has affected their fishing activity. Out of 100 respondents, 77% of people agreed that development has affected fishing activity, and 23% of the people said that development has not affected their fishing activity. Most people believe that development has affected fishing activity because of industries the seawater has been polluted, which has forced the fish to migrate to faraway places and even the coastal areas have been reduced. Even the city waste is being dumped in the creeks, one can see the plastic floating in the water. Few respondents said that during the rainy season as the water level rises due to heavy rain the plastic gets accumulated on the coast.

- **Since when the catch started to decline**

Sr.no	Decline of catch	No. of Respondents
1	since 1 year	5
2	since 2 years	32
3	More than 2 years	64

Table 4.5.20: Since when the catch started to decline

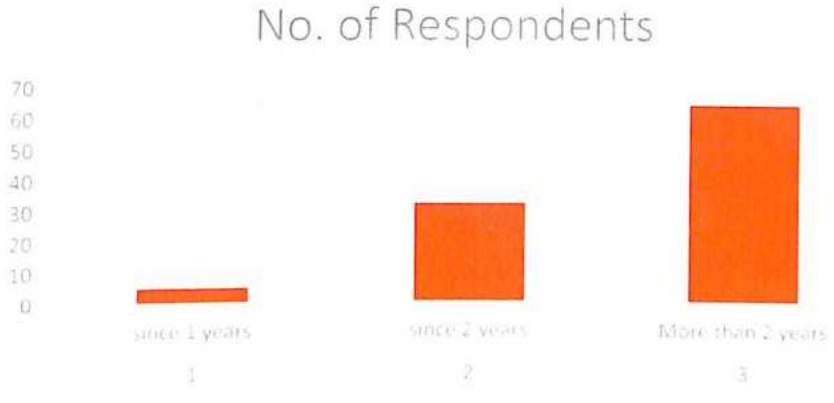

Figure 4.5.23: Graph representing since when the catch started to decline

The above graph indicates that since how many years the catch has started declining. Out of 100 respondents, 5 people said the fish has started declining 1 year back, 32 respondents said the decline in fish started taking place 2 years back and 64 respondents strongly agreed that development took place for more than 2 years. This implies that because of development there is a decline in fish.

- **<u>Reason for the decline of fish</u>**

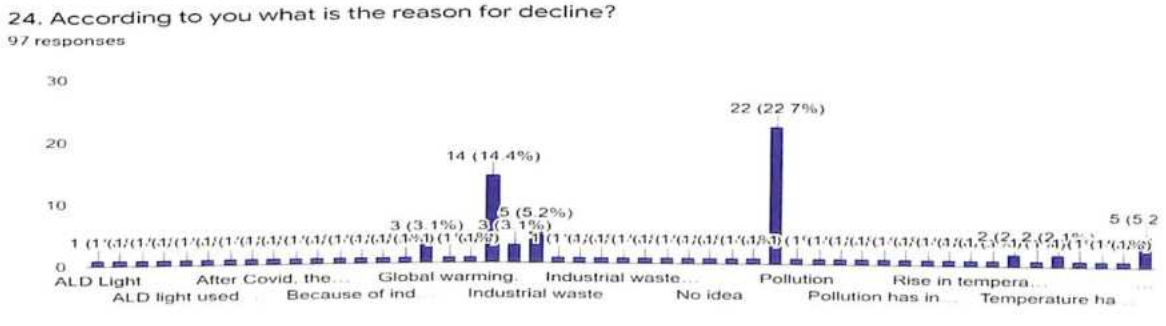

Figure 4.5.24: Graph representing reason for the decline of fish

The above graph shows the reason for the decline in fish. Out of 100 respondents, many respondents claimed that due to urbanization, has led to industrialization. This industrial waste has been left in the seawater, which has polluted the water. Urbanization is also one of the reasons for increasing temperature this has forced the fish to migrate, to a safer place. Some respondents claimed that due to the increase in pollution levels, the death of fish has also increased. Some respondents said that because of deep fishing ALD lights are used, and because of it, many of the fish have started declining. Some respondents stated that even global warming has also had a great impact on the decline of fish. This implies that the decline of fish has taken place at a great rate.

- **Government helps to carry out fishing activity**

Sr.no	Government helps to the fishing community	No of Respondents
1	Yes	64
2	No	36

Table 4.5.21: Government help to carry out fishing activity

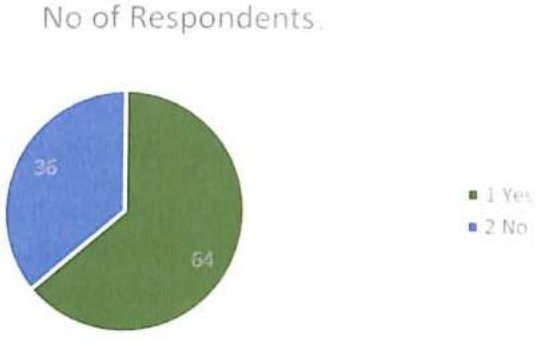

Figure 4.5.25: Pie-chart representing government help to carry out fishing activity

The above pie chart shows the help provided by the government to the fishing community. Out of 100 respondents, 64 people stated that the government provides help to carry out the fishing activity and 36 people stated that the government doesn't provide any help to carry out the fishing activity. Some people said that there are certain government policies through which they get the benefit. But some people claimed that the government says that they will provide help, but in reality, they don't get any benefits from it. This indicates that though there are certain government policies for the fishing community few can avail themselves of them. But some of the fishermen are still not aware of it.

- **Ownership of the house**

Sr.no	Ownership of house	No. of Respondents
1	Ownership of house	85
2	Rented	15

Table 4.5.22: Ownership of the house

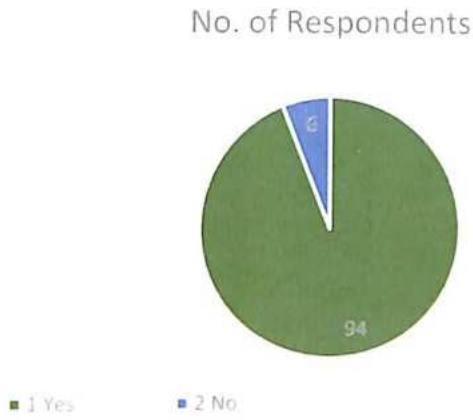

Figure 4.5.26: Pie-chart representing Ownership of the house

The above pie chart shows the distribution of the ownership of the house. Out of 100 respondents, 85 respondents are the real owner of their houses and 15 respondents are staying in rented, houses. The people who are staying in the rented house are the people who are staying there in search of a job. They have migrated from other states and are residing in Versova. Among them, some of them are the workers who are working in carrying out fishing are the ones who are staying there in a rented house. Most of the people are the owners of their houses. As the family started increasing, they turned their bungalow into a multi-store building. Some of the outer walls of the house have carvings of fish done as a symbol of the Koli people. They have big spacious rooms well decorated. Some of the fishermen men houses even have showpieces of wooden boats as similar to the one which is used in the fishing.

Plate 4.5.4 – Types of houses and the carvings

Source – The image is taken from the mobile

- **Accumulation of water during the rainy season**

Sr.no	Accumulation of water during the rainy season	No. of Respondents
1	Yes	60
2	No	40

Table 4.5.23: Accumulation of water during the rainy season

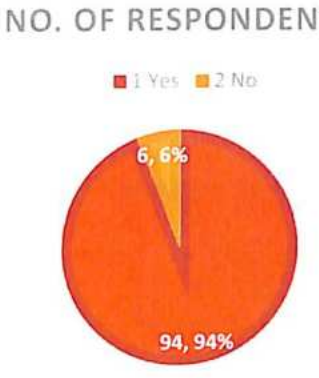

Figure 4.5.27: Pie-chart representing accumulation of water during the rainy season

The above pie chart shows the accumulation of water during the rainy season. Out of 100 respondents, 60 people said that they face the problem of water getting accumulated during the rainy season and 40 people said they don't face the problem of water getting accumulated during the rainy season. Few respondents said that during the time of rainy season water level also rises up near the coastal area and it reduces after some time.

- **Action taken during the time of the rainy season**

Sr.no	The action was taken during the rainy season	No. of Respondents
1	Water is removed	73
2	No action taken	27

Table 4.5.24: Action taken during the time of the rainy season

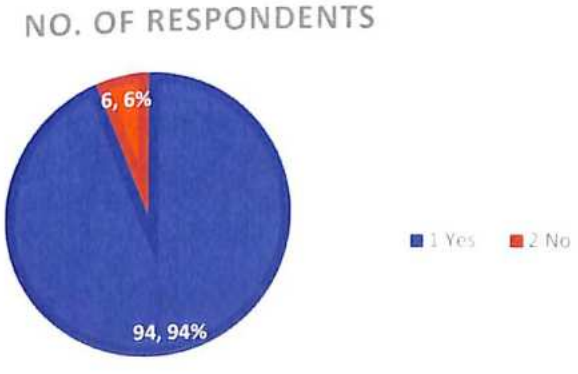

Figure 4.5.28: Pie-chart showing action taken during the time of the rainy season to remove water

The above pie chart shows whether action is being taken to remove the water during the rainy season. Out of 100 respondents, 73% people said that during the time of rainy season when water gets collected, it is being removed by the local people. 27% of people said that during the time of rainy season when water gets collected there is no action taken to remove the water. Some of the respondents even stated that the water does not get collected. This indicates that in some areas in Versova village people face a problem of water getting collected during the rainy season but is being removed.

- **Problem of sanitation**

Sr.no	Sanitation problem	No. of Respondents
1	Yes	77
2	No	23

Table 4.5.25: Problem of sanitation

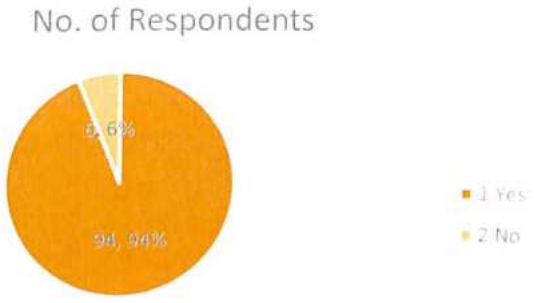

Figure 4.5.29: Pie-chart representing problem of sanitation

The above pie chart shows the number of respondents facing sanitation problems in that area. Out of 100 respondents, 77 respondents stated that they had a problem in their area. They said that the garbage gets collected every day. 23 respondents stated that they don't face sanitation problems in that area. Few respondents said that the waste of the fish which gets collected in the coastal areas is been sent to Sewri where it is dried and crushed into powdered and later, they are being used as a fertilizer on the farm. Some respondents even said that even the creek also has got polluted because of the waste which is left in the water.

- **Municipality help to clean the area**

Sr.no	Municipality help to clean area	No. of Respondents
1	Yes	94
2	No	6

Table 4.5.26: Municipality help to clean the area

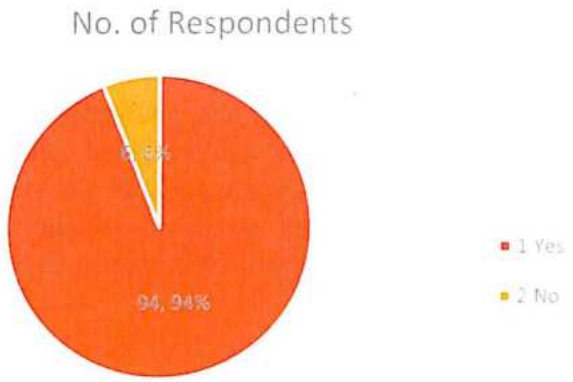

Figure 4.5.30: Pie-chart representing BMC help to clean the area

The above pie chart gives information about the Versova village whether they are provided with municipality help or not to clean the area every day. Out of 100 respondents, around 94 respondents said that the municipality provides help to the area to clean every day and only 6 respondents said that the municipality doesn't provide any help to clean the area. They said the garbage is sometimes left unnoticed. Some of the respondents said that the municipality, sometimes even collects the garbage twice a day.

Plate 4.5.5– Trash collected by the BMC

Source – The image is taken from the mobile

4.6 Conclusion

This chapter is about the information about the fishing community of Versova village of Mumbai. The chapter is based on the survey, the questionnaire, and the interpretation which was conducted in the Versova fishing community. It gives us information about the life of the people belonging to Versova Koli Wada, their culture, and their traditions. It also gives information on how the fishing activity is carried on, the technology used in the mechanical boats, their sanitation problems, a development that took place and its impact on the fishing ground, etc. This chapter also gives us information about the reason for the decline of fish. The following chapter deals with the major findings and the recommendations to be given to the fishing community.

CHAPTER 5

MAJOR FINDINGS, RECOMMENDATIONS, AND CONCLUSION

5.1 Introduction:

Mumbai city was made up of seven small islands. As it is surrounded by the coastal area it became an important ground for carrying out fishing occupations. The people who stayed near this area came to be known as the Koli people. They made their home in this region and they are known by every people for their beautiful customs and traditions.

Versova is famous for its beach and for fishing grounds. The people living in this place and those who are into fishing occupation are known as Kolis. From the above study of Versova Koli Wada, it is concluded that the majority of the men have included themselves in the fishing occupation that is from fishing to carrying out trade in the market. Even women play an important role in the fishing occupation as they are into marketing selling the fresh as well as dry fish. Fishing has become one of the main occupations of the fishermen to earn their livelihood. Last few years because of the development in the city the fishing community are going through some challenges while carrying out fishing. Industrial waste, as well as plastics, are being let in the seawater, and this has caused serious problems for the fish in the sea. This led to the depletion and migration of fish, to different regions. The fishermen prefer to make use of mechanical boats to avoid leakage in it and also the use of GPS. Problems of sanitation is being looked after by the BMC as well as by the locals. They have well developed houses. Along with the male fishermen, women are also into this occupation.

5.2 Major Findings:

After conducting the study of Versova Koli Wada some of the major findings which are identified are:

- Most, fishermen make use of GPS as an indicator in their mechanical boat when they go fishing because the cost of GPS is less which the fishermen can easily afford for it compared to wireless technology which they find it more costly as per their income.
- Very few respondents make use of wireless technology in their boats, because of its high cost.
- Use of GPS or any other wireless technology is made compulsory by the government for navigation and also for keeping track of the fish as to where they have been migrated.
- Government has implemented various policies for the benefit of the fishing community through which they can get benefits.
- Few respondents concluded that they are not benefited from the government schemes. They concluded by saying that the government provides help but it does not reach toward them.
- Men and women are treated equally in the fishing community. Women are into carrying out marketing whereas men go for fishing as well as selling fish in the market. Some of

the women, even dry the fish and sell it in the market which can be consumed throughout the year when it is not available to get the fresh fish.

- Due to urbanization development has taken place and it has affected the coastal areas. The land which was once used by the fisherfolk is being used by the government to improve the area.
- Because of increasing urbanization, industrial waste is being let out in the seawater, because of which the marine resources are in danger. Depletion of fish has become a major problem for fishermen. The fish have even started moving to different regions and due to this, the fishermen have to spend hours in fishing.
- Few respondents face issues in their community with regards to the availability of space to keep their fishing tools.

5.2 Problems:

Several problems have been identified after reviewing the study of Versova Koli Wada and the problems are:

5.2.1 General Problems:

- Shortage of workers after COVID-19. Due to the deadly virus which the whole world was fighting against it, the workers who were working in the fishing occupation had to leave their work and migrated back to their natives.
- Increasing price of the diesel has affected in carrying out fishing. The price of diesel is increasing day by day, because of which the fishermen find it difficult.
- During the rainy season as the level of water rises up the trash also comes to the coastal areas.

5.2.2 Specific Problems:

- Pollution of seawater has increased because of increasing industries.
- There is a decline in fish due to urbanization.
- Increasing temperature in the seawater has given a rise to migrate the fish to a colder region. Increasing temperature has become one of the major problems in the sea
- Development near coastal areas, has affected the fishing community.

5.3 Recommendation

- Measures should be taken to reduce the level of pollution in the seawater.
- The industries that are letting their waste in the seawater should stop it completely.
- We need to grow more and more plants to reduce the increasing temperature.

- Government should reduce the price of diesel so that the fishing community can easily afford it.
- The BMC as well as the locals has to take the initiative to clean up the plastic in the creeks to save marine resources.
- All the fishing community should be made aware of the benefits one can get through the government policies which are implemented for the fishing community.

5.4 Conclusion

From the above analysis, it can be concluded that India is surrounded by a coastal line of 7,516.6 km. India stands 2nd globally in the production of fish. Fishing is carried out in India as well as in other foreign countries. The people who are residing near the coastal area have made fishing their main occupation. The people living near the coastal areas in India are known as Kolis and the area where they reside is known as Koli Wada.

The study shows that fishing is the main source of their livelihood. At the same time, the fishing community faces a number of challenges when they carry out fishing in their area. As India is a developing country, development is taking place in every city. Versova Koli Wada which is situated in the city of Mumbai also has the coastal line where fishing is carried out. Because of the increasing development, a number of industries have been set up leading the seawater to get polluted. The study also gives information on why marine resources are in danger and the reason for the decline of fish in the seawater.

Versova creek which once clean water used to flow has become polluted because of the waste which is left out from many neighboring industries. There are other nullahs that have got connected to it making it more polluted and leading to the death of the fish. The study also shows that the temperature of the sea is increasing day by day, because of which the fishes are forced to move to a place where they can live in.

The fishing community prefers to use mechanical boats so that it becomes easy to move out miles and miles to practice fishing. The government has made it mandatory to have GPS in their boats before they go fishing. Some boats are even making use of wireless technology instead of GPS.

It has become essential for Government, local people, and NGOs to come ahead and look after the cleanliness of the beach and the fishing area. there is an extreme need for the Government to take action on dumping industrial waste to save biodiversity in the coastal region. There are certain steps taken by the Government to solve the income problem of fishermen during the off, fishing period, that is during the monsoon. Like Agro-tourism, one more activity can be added to beach tourism to increase the income of the fishing community. Because of tourist activity, it will add up to the regular income of the fishermen. So, it is important to save our coastal area and to keep our sea clean from pollution.

CHAPTER 6
QUESTIONNAIRE APPENDIX 1

1. What is your name?
   Ans. _____

2. What is your age?
   a. 20 – 29yrs
   b. 30 – 39yrs
   c. 40 years and above

3. Since how many years have you been engaged in a fishing activity?
   a. Less than 5 years
   b. 10 – 15 years
   c. More than 15 years

4. How many times do you go fishing?
   a. Daily
   b. Alternate day
   c. More than 3 days

5. Is fishing your only source of income?
   a. Yes
   b. No

6. If no, then what is the other source of income?
   Ans. _____

7. Where do you carry out fishing?
   a. Mostly freshwater
   b. Mostly saltwater
   c. Both

8. How far do you go to carry out fishing?
   a. Less than 5 miles
   b. More than 5 miles
   c. Depends on season

9. What kind of problems do you face while going for fishing?
   Ans. _____

10. What kind of boats do you prefer for fishing?
    a. Traditional
    b. Mechanical
    c. Both

11. Are, you owner the owner of your own boat?
    a. Yes
    b. No

12. Do you make use of GPS in your boat or is there any other use of technology?
    a. GPS
    b. Other technology

13. When you go fishing how many hours do spend doing it?
    a. 2 hours
    b. 2 – 5 hours
    c. More than 5 hours

14. Which is the best season of the year to go for fishing?
    a. Rainy season
    b. Winter season
    c. Summer season
    d. All the above

15. Why do you celebrate the Nariyal Purnima festival?
    Ans. _____

16. Are your family members involved in the fishing activity?
    a. Yes
    b. No

17. Are your kids going to school?
    a. Yes
    b. No

18. Do you teach your kids the skills of fishing?
    a. Yes
    b. No

19. Do you face problems in your fishing community?
    a. Yes
    b. No

10. What kind of boats do you prefer for fishing?
    a. Traditional
    b. Mechanical
    c. Both

11. Are, you owner the owner of your own boat?
    a. Yes
    b. No

12. Do you make use of GPS in your boat or is there any other use of technology?
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    Ans. _____

16. Are your family members involved in the fishing activity?
    a. Yes
    b. No

17. Are your kids going to school?
    a. Yes
    b. No

18. Do you teach your kids the skills of fishing?
    a. Yes
    b. No

19. Do you face problems in your fishing community?
    a. Yes
    b. No

20. If yes, what kind of problems do you face?
    Ans. _____

21. Do men and women equally participate in carrying out fishing activities?
    a. Yes
    b. No

22. Since how many years past development has taken place in this area?
    a. 5 years
    b. 8 years
    c. More than 10 years

23. Has development affected your fishing activity?
    a. Yes
    b. No

24. Since when has the catch started declining?
    a. Since, 1 year
    b. Since, 2 years
    c. More than 2 years

25. According to you what is the reason for the decline?
    Ans. _____

26. Does the government provide any help to carry out the fishing activity?
    a. Yes
    b. No

27. Do you stay in the rented house or are you the owner of your own house?
    a. Rented
    b. Owner

28. Does water get accumulated during the rainy season?
    a. Yes
    b. No

29. What actions are taken during the time of water collection?
    a. Water is removed
    b. No action taken

30. Do you face sanitation problem in your area?
    a. Yes
    b. No

31. Do you get any help from the municipality to clean up the area?
    a. Yes
    b. No

APPENDIX 2

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