ANNEXURE 1

OBSERVATION CHECKLIST

Indicators

I. Landscape/seascape diversity
   i. Mapping and observation
      
      **Natural ecosystem** (mountain, lakes, coastal lagoons, estuaries, mangrove forest)
      
      **Other points** - sea area, creek, marshy land, and tree local names (will find botanical names while writing)
      
      **Land use pattern** - (home garden, cultivated field, orchards, seasonal pastures, aquaculture, forestry, agroforestry, irrigation canals, water wells, barren land, drying land for fish and net, land to keep boats, land for selling fish - beach, jetty or inside village, fish landing place, crab picking sites)

II. Ecosystem protection
   i. Are there areas in the landscape or seascape where ecosystems are protected under formal or informal forms of protection?
   
   ii. Mangrove areas, sea, creek, marshy land, government land, community land, sacred places

   iii. Which ecosystem area is protected and what is the form of protection?

III. An ecological interaction between different components of the landscape/seascape
      
      Water (sea), coastal lagoons, mountain, mangroves, creek, marshy area, Land, water, marshy land, the high tide-low tide

IV. Recovery and regeneration of the landscape/seascape
   i. Does the landscape/seascape have the ability to recover and regenerate after extreme environmental shocks?
   
   ii. Reclamation for infrastructure development; housing; storage houses; natural calamity like flood, cyclone, extreme weather condition

   iii. What was the community’s response to these recent shocks and stresses?
V. The diversity of the local food system

Fish varities, local products, agricultural products, vegetables, fruits etc (bamboo- local or purchases?)

VI. Maintenance and use of local fish species

i. Different varities of local fish from sea, creek, marshy land; ornamental fish species; local names of fish;
   • Are different local fish species conserved and used in the community?
   • What type of different fish species are conserved?
   • Is the quality of fish species maintained?
   • How it has been maintained?
   • Do invasive species replace local one or not? (New highly demanded species/ ornamental)

VII. Sustainable management of common resources

i. Are common resources managed sustainably (Fishing practices, restriction in fishing (seasonal fishing), water management, control of local vegetation (logging), management of land

ii. What is the status of exploitation of common resources (sea, creeks, mangroves, fish resources?)

VIII. Innovation in fisheries and conservation practices

i. Does the community develop, improve and adopt new fisheries and conservation practices and/ or revitalize traditional one to adapt to a changing condition, including to climate change?
   • fishing technology (boats, nets, engines, methods of drying and catching fish)
   • (reason- less resource, climate change, competition, commercialization, less hard work)

ii. Which modernisation practices are used in managing fisheries?
   • Fishing technology (boats, nets, methods, engines)
• Mechanisation of crafts and gears.

IX. Traditional Knowledge related to biodiversity?
   i. Are local knowledge and cultural traditions related to biodiversity transmitted from elder and parents to young people in the community? (songs, dances, rituals, festivals, stories, local terminology related to land and biodiversity; specific knowledge about fishing; and processing and cooking of food)
      • Types of songs (related to which context)
      • Dance form
      • Rituals in family and community (daily, work site, festivals, for men and women)
      • Festivals
      • Stories related to village and culture
      • Fishing knowledge (availability of fish, a suitable time for fishing, natural calamity)
      • Basic knowledge about food and its varieties

X. Women’s knowledge
   i. Are women's knowledge, experience and skills recognized and respected at household, community and landscape level in the fishing community?
      • Related to business (drying, selling, catching, other)
      • Maintenance of resources (water management, land use pattern)
      • Fishing knowledge (which they use for their business, at home, in the community)

XI. Rights in relation to land/water and other natural resource management
   i. Does the community have customary and/or formally recognized right over land, water, and natural resources?
   ii. Access to (by the community)-Land, sea, creek, beach, mangroves, trees
   iii. Access and use (land use groups and co-management groups)-fishing cooperative, Panchayayat, municipal cooperation, revenue department, private groups (companies public sector units)
      • Do you have the right to access the sea/ beach area?
• Is there any restriction on you to use sea and land resources?
• How it impacts you?
• How these rights help you to use these resources?

iv. Do these rights give security in terms of access and use? (Land use groups/ co-management groups)

v. Fishing cooperatives, organization, Panchayat, NGOs, Municipal Corporation, community

XII. **Community-based landscape and seascape governance**

Rules and regulation, policies, norms, customary laws

i. Is there a multistakeholder landscape/seascape platform or institution able to effectively plan and manage landscape resources?

- Rules
- Policies
- Regulations and enforcement aimed at resource management
- Traditional authority and customary rules
- Co-management arrangement

ii. Does the management exist about the boundaries of natural resources in terms of access and use?

iii. Are the policy and legal environment supportive or not?

XIII. **Social capital in the form of cooperation across the landscape/ seascape:**

i. Are there a connection, coordination and cooperation within and between communities for the management of natural resources? (SHGs, community club and groups, woman’s and youth group, fishing group and market)

ii. Intercommunity networks, an association of federation with a focus on NRM?

iii. Is the level of out-migration low?

XIV. **Social equity (including gender equity)**

i. Is access to opportunities and resources fair and equitable for all community members, including a woman at household, community and landscape level?
(Resources availability, access to resources, education, job opportunities, market, access to water resources, access to land)

ii. Are woman's voices and choices taken into consideration in household decision making and at the community meeting where decisions about collective action are made?
(Govt. organization level, Panchayat, cooperative offices, community organization, festivals, government schemes)

iii. Who has access to what resources and why?

iv. How have urbanization/ environmental change influenced to access profile?

v. Is decision making fair and equitable for all community, including women at all level?

XV. Socio-economic infrastructure

i. Is the socio-economic infrastructure adequate for the needs of the community?
(School, hospital, roads, transport, safe drinking water, market, electricity and community infrastructure)

XVI. Human health and environmental conditions

i. What is the general health situation of local people also considering the prevailing environmental condition?
(Absence or regular occurrence of diseases, the frequency of disease outbreak that affect large no of people; types of diseases like malaria, HIV, TB; absence/presence of environmental stresses like pollution; lack of clean water, exposure to extreme weather events)

ii. What are the main risks? What types of medicines are used (traditional healing/ modern medicine)?
Traditional, Ayurvedic, homoeopathic, allopathy

XVII. Income diversity

i. Is a household in the community involved in a variety of sustainable income generating activities? What activities generate income in the landscape or seascape?
Catching fish, selling fish, work on other boats, rearing of animals (cattle, duck, cock, goats), work in companies, run shops, and other different jobs

XVIII. **Biodiversity and livelihoods**
   
   i. Does the community develop the innovative use of the local biodiversity for its livelihood?
   
   Handicraft, tourism, fish processing, local food processing, transportation in the creek, local community festivals

XIX. **Socio-ecological mobility**

   i. Are household and communities able to move around between different production activities and location as necessary?
   
   (Diversifying livelihood, seasonal migration, shifting fishing grounds, maintaining reverse areas during times of hardship)

   ii. Are there agreed rules and regulations for effectively doing so?
ANNEXURE 2
INTERVIEW GUIDE

Personal information

- Name of the village
- Age
- Sex
- Marital status- Married/unmarried/ divorced/widow
- Educational qualification
- Past occupation
- Present occupation

Questions

1. How was your village in your childhood?
2. What did your parents and grandparents tell you stories about your village at their time?
3. How was the resource availability in your childhood?
4. How was the natural condition of your village at your childhood?
5. Do you know any stories about the settlement of the Koli community in Mumbai? When you settle in your village? How your community did come to stay in this village?
6. Can you draw a map of your local community/how it was earlier? How was your home, neighbour, sea, market, gathering place etc?
7. What are the memories of yours related to it?
8. What are the different livelihood activities villagers used to do for their livelihood?
9. How was the land structure of your village?
10. How it has changed throughout the period?
11. Why these changes take place in your village?
12. How is it impacting on environment, village and community?
13. How is it impacting on the resources?
14. Where is your village located earlier?
15. What are the changes that have appeared in its location?
16. Why these changes are take place?
17. Do you migrate to other places for your business? Why?
18. How far is the beach area of your village?
19. How the distance of the beach area decreased? If yes, then why?
20. Where did people used to gather for a public meeting?
21. What was the importance of a public meeting place in your village or community?
22. How was the water availability in your village?
23. What are the changes seen in it?
24. How is it impacting on your community?
25. How new constructions in the sea has been impacting on your livelihood?
26. How was the situation in your village before urbanization?
27. What was the population structure of your village? What were the different communities that used to stay here in your village?
28. What are the changes that are taking place in the present context in the size of the population of your villages?
29. Why are these changes taking place in your village?
30. How it impacts you and Koli community?
31. How was the quality and availability of fish at that time?
32. What types of fish species were available in the past?
33. What are the changes seen till now in quality and quantity of fish production?
34. What types of resources were used to catch fish?
35. Who used to catch the fish earlier?
36. What are the changes take place in catching of fish? What have the different types of equipment come in the fisheries sector?
37. What was the impact of that change on your village?
38. What was the condition of women at an earlier age?
39. What type of work did they use to do at home and in the fishing sector?
40. What was their contribution in fisheries sector?
41. What type of market was available in your village?
42. How far you have to go to sell fish?
43. Why you go there to sell fish?
44. How it impacts you?
45. How was the condition of the market at that time?
46. Who dominated the market at that time?
47. What are the changes that are seen in market structure in the present situation?
48. Who are the new actors who came into the market?
49. What is the impact of it on your community?
50. How it is impacting on your traditional livelihood activity?
51. What institutions were present in the past in your village?
52. What was the role of that institution?
53. What is the role of the institution in environmental change and its impact?
54. What are the values and norms you have to follow in your family?
55. What are the norms and values that you have to follow in Koli community?
56. What are the changes take place in traditional cultural activities?
57. What was the nature of your employment?
58. How it has changed throughout time?
59. What were the different skills you used in fisheries?
60. What are the changes appeared in your skills related to fisheries?
61. How did you acquire those skills?
62. What type of knowledge you had about your ecosystem for your livelihood?
63. How did you acquire that knowledge?
64. Do you get permission to catch fish from the sea?
65. What was the importance of the sea in your community?
66. What are the rituals or traditions you follow related to sea in your village?
67. How have these rituals evolved?
68. How do these rituals help to preserve the environment?
69. Are you still following those rituals? If no, why?
70. How it is impacting on your village or livelihood?
71. How an environmental indicator helps you in fisheries?
72. What are the changes take place in using those indicators?
73. How it is impacting on fisheries?
74. What community traditions you follow in the present situation?
75. How was it earlier?
76. How your community traditions are related to fisheries, sea and environment?
77. What are the stories are related to it?
78. What are the changes you have seen throughout this period in natural calamities?
79. How it is impacting on you?
80. Have you faced any man-made calamities in past or when you were young?
ANNEXURE 3
SEMU-STRUCTURED INTERVIEW SCHEDULE

‘Transitions in Coastal Landscapes: A study on the Livelihood Struggle of Koli Women in Mumbai’
Semi-structured Interview Schedule (gender analysis)

ID No.………..
Date:…………………
Place:………………..
Time:…………………
Caste/ community:…………

1. Village:

2. Demographic profile:

<table>
<thead>
<tr>
<th>Household member</th>
<th>Age</th>
<th>Sex</th>
<th>Education</th>
<th>Marital status</th>
<th>Past occupation</th>
<th>Present occupation</th>
<th>Health status &amp; special need</th>
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</tbody>
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2.1 Any key observation/comments:

3. Livelihood activity
3.1 What activities do you undertake in your household?

<table>
<thead>
<tr>
<th>Livelihood activity</th>
<th>Men</th>
<th>Women</th>
<th>Worker (men)</th>
<th>Worker (women)</th>
<th>Monthly income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working at fish loading centre</td>
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<tr>
<td>i. Sorting</td>
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</tbody>
</table>


ii. Cleaning and transporting fish & shrimps
iii. Selling basket & ice
iv. Repairing boats
v. Preparing & selling food for fisherman
vi. Finance supplier
vii. Give boat on lease
viii. Catching of fish
ix. Making net
x. Wholesale retailing
xi. Drying
xii. Smoking
xiii. Shrimp processing
xiv. Peeling
xv. Vending
xvi. Catching of crabs/shells
xvii. Remain at home
xviii. household work
  - cooking
  - cleaning house
  - wash utensils & cloths
  - take care of children
  - gardening
  - Carrying water
  - Healthcare
xix. Community meetings
xx. School meetings
xxi. Society meeting
xxii. Other

I. **Environmental change and traditional livelihoods**
   1. How do you define your coastal environment?
   2. What have been the most important changes in this coastal environment?
   3. Out of these changes, which is the most threatening to you? Why?
   4. According to your opinion, what are the causes of these changes?
   5. What is the present status of your coastal environment? Has it become more risk-prone?
6. What are the areas that are usually affected by environmental changes and hazard in your village?
7. Which are the most affected households in your village due to environmental change and hazard?
8. Have any people lost their lives due to these changes?
9. Have any people affected in terms of sustaining their livelihood with environmental change?
10. Were you subjected to evacuation at any time due to environmental crisis or hazard?
11. What is the extent of damage to your asset and property due to environmental changes?
12. What are the likely impacts of environmental changes/ insecurities on your livelihoods?
13. What other challenges do you face due to these changes?
14. What are the past and current environmental events and conditions affecting the livelihood resources? Are these events and conditions worse now than they use to be?
15. What evidence of environmental change is already being observed? (preliminary list from oral history and anecdotal information from field work)
16. What are the changes happened related to water availability and water quality in the village? How has it impacted their livelihoods?
17. What have been changes related to fisheries based livelihood in the village? How it has impacted them?
18. What changes do they project with respect to their livelihood and resource availability?
19. Which social and economic group within the village are particularly vulnerable to the changes in the environment livelihood linkage?
20. Which resources are most important to the livelihood of different social groups including men and women?
21. Which livelihood resources are now requires coping with the immediate impact of environmental change?
22. Are current coping strategies used by different groups to deal with environmental change? Are they sustainable?
23. Do current coping strategies differ from once used in the past? If yes, why?
24. Which livelihood resources are needed to build long-term adaptive capacities?
25. What is the nature of coastal hazard in the region? How is it related to coastal related development? How are these coastal hazards affecting their livelihood?
26. What opportunities exist for diversification of livelihoods?
27. What are the constraints for the diversification of different livelihood?
28. Do women have equal access to infrastructure and services necessary for adaptation to environmental change and livelihood insecurity?
29. Do women have access to and control over critical livelihood resources?
30. Do they have a voice in the local, district, state and other levels of decision making related to environmental and livelihood security?
Non-productive labour

Water

- Who is responsible for securing water for the household?
- Who controls water resources in household and communities?
- Who is involved in decision making on water management at the local level?
- Are there any inequalities in access to water in the community?
- Are there any differences in water demand and usage within the communities?
- Is water a source of conflict in a community or region?
- What is the level of household income?
- Are household forced to use their percentage of their income buying water from outside?
- How it is adding vulnerability to your livelihood?

Land

- Who has the authority of land of your household?
- Who maintains the record of land and household?
- Who takes decision-related to household and land?
- Are there any inequalities in access to land in the community?
- Is land a source of conflict in the community?
- Do you pay taxes for your land?
- Do you use your household for your personal income?
- How it is adding vulnerability to your livelihood?

Energy (cooking and lighting)

- Who is responsible to look after fuel, which you use in the household?
- Do you have easy access to fuel (cooking)?
- What kind of resources do you use for cooking and lighting in the house?
- How much you have to invest in energy resources?
- Do you get any subsidy on fuel? (gas, kerosene)
- How does it add vulnerability in your day to day life?

Health

- Do you have access to the health centre in the village? If no, then where you approach for that?
- How far are the health centres in your house?
- In an emergency condition, how you manage to reach a health centre?
- Who looks after ill person in the household?
• When women in the household fall ill then who looks after household work and other work?
• Do you approach mid-wives or hospitals for delivery? Why?
• How much you have to invest now for health in the household?
• How it is adding vulnerability in your day to day life and livelihood?

Beach

• How far is the beach area of your house?
• How you use the beach area in your day to day life?
• How it has changed in the past?
• Do your children use the beach area for playing?
• Is it covered by waste material, plastic and debris?
• How beach area is important for you?
• Can everyone access the beach area?
• How you use the beach area for religious and cultural purpose?
• How it makes your livelihood vulnerable?

Education of children

• Do you provide education to your children?
• How much you invest in their education?
• What type of education do you prefer to provide for your children?
• Who looks after studies of children in your household?
• Do your children have easy access to school/ college in your village? Where they have accessibility?
• How it affects you?

Soil

• What is the nature of the soil in your village?
• What is the nature of sand on the beach area?
• Is the soil in your village is cultivable?
• Is soil present in the village or it made concretized?
• How it affects you or your livelihood?

Flora and Fauna

• What are the different types of trees are present in your village?
• What are the different types of animals and birds you can see in your village?
• What are the different types of fish species you get near the coast of your village?
• What are the changes you see in flora and fauna? (fish, animal, birds, plants)

Food security
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• What are the main sources of food in your household?
• What type of food do you prefer in your household?
• Do you cultivate vegetables for your consumption?
• Do you have the accessibility of fish for your intake in present condition?
• In monsoon season, what you prefer in your food?
• How it affects you?

**Fisheries** (capture, selling, drying, consumption, fish processing unit)

• Who make decisions on the various aspects of fisheries-related livelihood at the household level?
• Who is responsible for fisheries-related labour? At Sea and back in the land?
• Who makes a decision on using or selling fisheries related product?
• What are the constraints to innovations/ adaptations in fisheries (such as insecure land tenure, lack of input, international fisheries regulations)
• What is the relation between household and fisheries related decision?
• Who looks after savings and credits at your house?
• Who takes decisions on alternate livelihood than fisheries in your household?
• Income/ savings and credits/ decisions on alternate livelihoods other than fisheries/ income decision

**Market**

1. How do you define a fishing community 20-30 years back? Has it changed today?
2. How do you then define a Koli woman in your society? How has it changed over the year?
3. What are the changes that are noticed in the selection of fishing gear and craft now and then? (technology)
4. In this context how have the norms related to fishing and selling practices changed? How do you look at these changes?
5. What changes seen in the buying and selling of fish? In this regard how the norms of fish change and sell have has changed? Has it affected the collective spaces of the community? How do you look at these changes?
6. What are the various conflicts in fishing and in selling fish?
7. Do you take licenses? Why? Are licenses necessary? (to men in boating/women in the market)
8. What are the various rules and regulations that you have to follow in fishing/ selling fish? (in market/in the sea for fishing)
9. How do the fish worker cooperative and Grampanchayat help you? (market/ fishing)

**Traditional knowledge system**
1. How do you forecast the fish yield?
2. Are you able to predict environmental changes/hazard/fish availability with respect to the following factors?

<table>
<thead>
<tr>
<th>Natural Factors</th>
<th>Prediction</th>
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<tbody>
<tr>
<td>harvest or absence of particular fish variety</td>
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<tr>
<td>the colour of the sea</td>
<td></td>
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<tr>
<td>strength or no of the direction of the sea waves</td>
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</tr>
<tr>
<td>Observing Wind</td>
<td></td>
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<tr>
<td>observing the temperature and humidity</td>
<td></td>
</tr>
<tr>
<td>appearances or disappearances by looking at the stars</td>
<td></td>
</tr>
<tr>
<td>the rings around sun and moon</td>
<td></td>
</tr>
<tr>
<td>occurrence of lightning</td>
<td></td>
</tr>
<tr>
<td>associating with the cry of frog</td>
<td></td>
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<tr>
<td>observing the movements of frog</td>
<td></td>
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<tr>
<td>smelling the sea or soil</td>
<td></td>
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<tr>
<td>observing the rigidity or looseness of soil</td>
<td></td>
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<tr>
<td>observing flight or behaviour of birds</td>
<td></td>
</tr>
<tr>
<td>observing the movement or behaviour of animals</td>
<td></td>
</tr>
<tr>
<td>The behaviour of fish (colour, sound, floating on the surface or deep sea, etc)</td>
<td></td>
</tr>
<tr>
<td>observing and movement of sea snakes</td>
<td></td>
</tr>
<tr>
<td>Other marine organisms like dolphins, sea</td>
<td></td>
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<tr>
<td>elephants, tortoise</td>
<td></td>
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<tr>
<td>--------------------</td>
<td></td>
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<tr>
<td>• Behavioural change due to the blooming of particular trees</td>
<td></td>
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<tr>
<td>• Mudbank phenomenon present and past</td>
<td></td>
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<tr>
<td>• High tide and low tide</td>
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</tbody>
</table>

3. Do you have any spiritual beliefs related to your coastal environmental, environmental change and livelihoods?
4. Are there any myths related to your coastal environment and livelihood? (ask about menstruation)
5. Do you practice any ritual to safeguard any environmental change / to protect yourself from environmental change/ livelihood security?
6. Do you have any specific proverb related to your sea environmental change and livelihood?
7. How has this knowledge system helped you to deal with environmental change?
8. Has the change in the family structure affected the knowledge structure?
9. Has fishing technology affected the knowledge structure?
10. Has the coastal environment affected on traditional knowledge system?

**Traditional knowledge - market**

1. Do you have to use your knowledge related to fish while vending? How?
2. When fish selling is convenient? Why?
3. What type of knowledge did you require to deal with customers?
4. How do you predict the availability of fish while at the market?
5. What time does the fisherman prefer to catch fish? Why?
6. Do you have to explain about fish to the customer while selling it? Why?
7. Do customers prefer particular parts of fish only? Why?
8. Are there any species which should be alive while selling it? Why?
9. Why you use a particular type of basket to keep crabs, shells?
10. Is there any particular skill or technique you need to cut fish? If yes, what are those techniques?
11. Does customer demand to cut fish in any particular type?
12. Was there any particular knowledge your community had to preserve fish for a long time?
13. Do you make any fish preserved products (like a pickle, chatni etc)?
14. What are the methods or techniques you use in the market for buying and selling fish? (eg like hatta method)
15. Which technique is useful to you? Or you find beneficial for you?
16. What is the calculating method you use in the market?
Vulnerability context

1. What are the various problems that your community faces today?
2. Who is the demographic group vulnerable in the village? (exposure)
3. What is the nature of dependence on resources and services vulnerable to environmental and livelihood security? (sensitivity)
4. What is the perception of women in resource conditions to deal with shocks? (sensitivity)
5. How have coastal development projects and practices affected your environment?
6. How have coastal development projects and practices affected your livelihood?
7. Has any policy interventions accelerated environmental degradation? How has this affected your livelihood?
8. How do you come to know about environmental change/risk in your village or region?
9. Does the separation of families affect resource availability in the family?
10. How your livelihood has changed or difficulties you face due to changes in family structure?
11. Does woman have to take all the responsibilities of the household in nuclear families? How it put the burden on a woman and her livelihood?
12. How new types of nets and boats exploiting resources?
13. Does an export of fish put the burden on resources? How?
14. Does woman get more affected by Fishing pattern and export of fish? How?
15. Does change in fishing time and fishing in monsoon season affected the resources? How?
16. Does particular varieties started diminishing due to demand of particular varieties?
17. Does the preference of customers for particular verities of fish affect your fish sell? how?
18. Does increased prices of fish reduced customers in the market?
19. Do malls and air-conditioned fish market become a major competitor for women vendors?
20. selling route, selling type- where you prefer to sell fish?
21. fishing norms- related to resource access and livelihood
22. sanctions
23. instances of collective actions-marriage, fish buying etc
24. Does the licensing system in the market put hindrance in selling fish? How?
25. Have you faced any problem in the market due to the license system?
26. fish workers welfare schemes, pension schemes, fish workers cooperatives, resource enhancement program, aquaculture
27. Are there non-environmental related factors that present an important risk in the village?
28. How have environmental changes (along with factors of modernization and urbanization) affected livelihoods and related resources of different groups?
29. Which livelihood sources are most vulnerable to environmental change?
30. How do poverty, gender and marginalization contribute to vulnerability to environmental change and livelihood insecurity?
31. How air force base affected their livelihood?

**Livelihood asset**

1. **Human Asset**

<table>
<thead>
<tr>
<th>Questions</th>
<th>Yes</th>
<th>No</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Are there any training programs for fisherman or fisherwomen for fishing business? What are those?</td>
<td></td>
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</tr>
<tr>
<td>ii. Do you migrate (market/fishing site) to another place for your business? If yes, then where?</td>
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<tr>
<td>iii. Have you adopted new skills or technology for your business with changing time? What type of technology?</td>
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<td>iv. Do you choose any other occupation at the time of slack period? What types of occupation?</td>
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<tr>
<td>v. Do you take decisions while choosing other livelihood option?</td>
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<tr>
<td>vi. Do you access food from ‘Public Distribution System’ (PDS) shops?</td>
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<tr>
<td>vii. Is there any impact on your accessibility of food due to the natural hazard? How?</td>
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<tr>
<td>viii. Is there any government program which helps you with the accessibility of food? Which programs?</td>
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<tr>
<td>ix. Do you have any disability/health issue which prevents you from doing your business? How?</td>
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</tbody>
</table>
x. Is alcoholism creating a problem in your business or work? Remark.

xi. Do you have accessibility to health care centers? Where?

xii. Do education helps you in your business/ work? How?

xiii. Have you hired workers on the boat? How many workers? How much you invest in them?

xiv. Have you hired workers to work in drying land? How many workers? How much you invest in them?

2. Natural asset

<table>
<thead>
<tr>
<th>Questions</th>
<th>Yes</th>
<th>No</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Do you own drying land? How much land you have? Nature of land?</td>
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<tr>
<td>ii. Do you still dry fish on the land you owns or have you leased it out? Why?</td>
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<tr>
<td>iii. Is land an asset for your present form of livelihood? How?</td>
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<tr>
<td>iv. Do you have space to keep your boats? Where? Who owns that land?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>v. Do you have space to keep your nets? Where? Who owns that land?</td>
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</tr>
<tr>
<td>vi. Do you own land in the village for your house? How much land?</td>
<td></td>
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</tr>
<tr>
<td>vii. Do you have your own house? What type of house?</td>
<td></td>
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</tr>
<tr>
<td>viii. Do you have access to water resources in your village? Sources?</td>
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<tr>
<td>ix. Do you have access to clean</td>
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</tbody>
</table>
drinking water in your village? Sources?

x. Do you have access to clean drinking water at the market/work site? Sources

xi. Do you have permission to catch fish from the sea? If no, why?

xii. Do you access to fish for vending? Sources?

xiii. Do women have accessibility to catch fish? How do you catch?

xiv. Do you have access to water for cleaning and for fish in the market/work site? Sources?

<table>
<thead>
<tr>
<th>3. Social assets</th>
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</thead>
<tbody>
<tr>
<td><strong>Questions</strong></td>
</tr>
<tr>
<td>i. Does your family participate in social gathering and cultural activities? What are those?</td>
</tr>
<tr>
<td>ii. Is there any cultural activity in which women can’t participate? What are those?</td>
</tr>
<tr>
<td>iii. Have you got married in the village? If no, why?</td>
</tr>
<tr>
<td>iv. Is there any problem you face as you got married outside the village girl/boy? How?</td>
</tr>
<tr>
<td>v. Does your neighbourhood help you at the time of crisis? How? In what situation?</td>
</tr>
<tr>
<td>vi. Do you help fellow vendors in the market? How?</td>
</tr>
<tr>
<td>vii. Do you have a membership in any organization/SHG/religious group in your village? Which groups?</td>
</tr>
<tr>
<td>viii. Is there any separate</td>
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<tr>
<td>Questions</td>
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<tr>
<td>-----------</td>
</tr>
<tr>
<td>i. Do you look after a financial matter of family? If no, then who looks after?</td>
</tr>
<tr>
<td>ii. Are there any insurance facilities particularly for the fishing communities? What are those?</td>
</tr>
<tr>
<td>iii. Have you taken any kind of insurances? What are those?</td>
</tr>
<tr>
<td>iv. Do you get that insurance money in the crisis? If yes, From whom? If no, then what you do?</td>
</tr>
<tr>
<td>v. Do you get regular income in your business? If no, why and then what you do?</td>
</tr>
<tr>
<td>vi. Is there sharing pattern in fisheries business? If yes, how is sharing pattern?</td>
</tr>
</tbody>
</table>

**4. Financial assets**

<table>
<thead>
<tr>
<th>Questions</th>
<th>Yes</th>
<th>No</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Do you look after a financial matter of family? If no, then who looks after?</td>
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<tr>
<td>ii. Are there any insurance facilities particularly for the fishing communities? What are those?</td>
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<tr>
<td>iii. Have you taken any kind of insurances? What are those?</td>
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<tr>
<td>iv. Do you get that insurance money in the crisis? If yes, From whom? If no, then what you do?</td>
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<tr>
<td>v. Do you get regular income in your business? If no, why and then what you do?</td>
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<tr>
<td>vi. Is there sharing pattern in fisheries business? If yes, how is sharing pattern?</td>
<td></td>
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<tr>
<td>Questions</td>
<td>Yes</td>
<td>No</td>
<td>Remarks</td>
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<td>--------------------------------------------------------------------------</td>
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<tr>
<td>vii. Do you have savings for your living cost? If no, how you manage?</td>
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<tr>
<td>viii. How you do saving (other than money)? (land, jewellery, home, vessels, other)</td>
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<tr>
<td>ix. Do you take informal credit? If yes, from whom?</td>
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<tr>
<td>x. Do you get money immediately when you sell fish? If no, what is the nature of payment?</td>
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<tr>
<td>xi. Do you have a bank account? Who looks after it?</td>
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<tr>
<td>xii. Is there a different scheme for women in banks? If yes, what are those?</td>
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<tr>
<td>xiii. Do you take a loan from banks? For what?</td>
<td></td>
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<tr>
<td>xiv. Do you have any debt? Why?</td>
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<tr>
<td>xv. Were you able to repay your debt? If no, why?</td>
<td></td>
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<tr>
<td>xvi. Do you require borrowing money in monsoon season from other sources? Why?</td>
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<tr>
<td>xvii. Do you get any kind of pension? What type of pension?</td>
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<tr>
<td>xviii. Do you get a profit from your fishing business? If no, why?</td>
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</tbody>
</table>

5. Physical assets

<table>
<thead>
<tr>
<th>Questions</th>
<th>Yes</th>
<th>No</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Do you have a permanent place in the market for vending? If no, why?</td>
<td></td>
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<tr>
<td>ii. Do you face any threat of evacuation from your place of vending by the government? Why?</td>
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<tr>
<td></td>
<td>Question</td>
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<td>-------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>iii.</td>
<td>Do you have a market in the village? How far it is from your house?</td>
<td></td>
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<tr>
<td>iv.</td>
<td>Do you have a transportation facility for carrying fish to the market? What type of transportation available or you use?</td>
<td></td>
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<tr>
<td>v.</td>
<td>Do you have the proper infrastructure in the marketplace for vending? If no, why?</td>
<td></td>
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<tr>
<td>vi.</td>
<td>Do you have a sanitation facility in the marketplace? If no, why</td>
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<tr>
<td>vii.</td>
<td>Do you have a toilet facility at home? If no, why</td>
<td></td>
<td></td>
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<tr>
<td>viii.</td>
<td>Do you have hospital or health centers in the village? If no, where you access?</td>
<td></td>
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<tr>
<td>ix.</td>
<td>Do you face any problem in accessing transportation during extreme weather event or with a change of season? Why?</td>
<td></td>
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<tr>
<td>x.</td>
<td>Do you face problem in the marketplace for vending in extreme weather condition or with a change of season? Why?</td>
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<tr>
<td>xi.</td>
<td>Do you own types of equipment for vending? What are those?</td>
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<tr>
<td>xii.</td>
<td>Do you have access to ice for preservation of fish? Resources?</td>
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<tr>
<td>xiii.</td>
<td>Do you have a preservation facility at the marketplace? Resources?</td>
<td></td>
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<tr>
<td>xiv.</td>
<td>Do you own your boat? What type of boat do you own?</td>
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<tr>
<td>xv.</td>
<td>Do you have any difficulty in accessibility of net? Why?</td>
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<td></td>
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<tr>
<td>xvi.</td>
<td>Do you have the infrastructure at the jetty? If no, why?</td>
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<tr>
<td>xvii.</td>
<td>Do you have landing centre? What type of centre?</td>
<td></td>
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<tr>
<td>xviii.</td>
<td>Do you have accessibility to diesel/fuel oil? Sources?</td>
<td></td>
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<tr>
<td>xix.</td>
<td>Do you have schools in your village? How many and which are those? If no, where you access?</td>
<td></td>
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<tr>
<td>xx.</td>
<td>Do you have a problem in your house in extreme weather condition or with a change of season? Why?</td>
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</tbody>
</table>

1. What are the factors making Koli women more vulnerable?
   (Low quality of fish, Less quantity of fish, Low selling, Weak transportation, Hard to preserve fish, Health issues, Sanitation problem, Space/shelter in the market, No space for drying, Size of fish, Type of fish)

2. What are the factors adding vulnerability in your occupation?
   - Gender, Age, Caste, Language, Being single/widowed/divorced, Illiteracy,
   - Size of family, Any kind of disability/health issue, The poor condition of the family, Norms/culture, Class, Marriage, Voiceless in community/family
   - Availability of fish, Types of fish species, Size/quality of fish, Pollution, The ban on a fish variety, New technology in fisheries
   - Availability of transportation, Availability of resources, Natural hazard, Manmade hazard, Weather condition
   - Availability of market, Space in the market, Lack of sanitation facility, Lack of preservatives, New actors in the market, Change in market structure/malls, Preference of customers, Festivals/ fasting days, Dealers in the market, Lack of security in the market
   - Access to government schemes, Debt, Lack of saving, Lack of access to an insurance scheme, Lack of subsidies, Export-import by the state, Politics
   - Development in the village, Population growth in the village, New construction in the village, Migrants
## Vulnerability in different spaces, interfaces and adaptation

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Space</th>
<th>Actors</th>
<th>Threats and constraints women faces in these spaces</th>
<th>How do they deal with it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>House</td>
<td></td>
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<tr>
<td>2</td>
<td>Local non-fish Market</td>
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<tr>
<td>3</td>
<td>Religious Spaces</td>
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<tr>
<td>4</td>
<td>Institution/community organization</td>
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<tr>
<td>5</td>
<td>Workspaces</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td>Banks</td>
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<tr>
<td>7</td>
<td>School/ Colleges</td>
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<tr>
<td>8</td>
<td>Local transportation: local train/bus/taxi/auto/tempo/metro</td>
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<tr>
<td>9</td>
<td>Fish market</td>
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<tr>
<td>10</td>
<td>Cinema hall</td>
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<tr>
<td>11</td>
<td>Government organization</td>
<td></td>
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<tr>
<td>12</td>
<td>Drying land area</td>
<td></td>
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<tr>
<td>13</td>
<td>Beach area</td>
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<tr>
<td>14</td>
<td>Road</td>
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<tr>
<td>15</td>
<td>Others</td>
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</table>

### Adaptation

1. How your current livelihood is supporting your household?
2. What are the changes in income in the household due to present livelihood?
3. Why you chose other livelihood options than traditional fishing practices?
4. Are your household is aware of environmental changes and livelihood insecurity in your community? How?
5. Do you use your local knowledge and formal knowledge to overcome environmental challenges?
6. Do you use local knowledge and formal knowledge to overcome problems in your livelihood?
7. How does society/community help at the time of crisis in your livelihood?
8. Does the community come together to help the household who lost everything in hazard or accident? How?
9. How do cooperatives help the fishing community with respect to environmental change and natural hazard?

10. How your households come over from an accident/death in the family?

11. How community support to the family at the time of accident/death in the family?

12. How you adapt to fisheries technology over a period of time?

**Adaptation to Environmental change**

13. What is your first response to an Environmental risk or livelihood shocks?

14. Do you wait for actions from our local government or neighbour to respond during any Environmental crisis?

15. What steps do you take to protect from Environmental change?

16. Do you use locally available resources to build a house?

17. What steps do you take to protect your property from Environmental risk and hazards?

18. What steps do you take to protect fishing crap/ wear and other livelihood assets?

19. Have you shifted your fishing grounds?

20. What adaptation strategies do you undertake to improve your livelihood?

<table>
<thead>
<tr>
<th>Impacted asset base</th>
<th>Livelihood strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. To improve resource availability</td>
<td></td>
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<tr>
<td>ii. To preserve resources</td>
<td></td>
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<tr>
<td>iii. To deal with the natural hazard</td>
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<tr>
<td>iv. To deal with the manmade hazard</td>
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<td>v. To reduce pollution in the village</td>
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<tr>
<td>vi. To get more customer</td>
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<tr>
<td>vii. To improve the economic condition</td>
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<tr>
<td>viii. To get income in the monsoon /slack period</td>
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<tr>
<td>ix. To get space in the market</td>
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<tr>
<td>x. To compete with other actors in the market</td>
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<tr>
<td>xi. To improve the health condition</td>
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<tr>
<td>xii. To get education</td>
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</tr>
<tr>
<td>xiii.</td>
<td>To improve social relation</td>
</tr>
</tbody>
</table>
xiv. | To get government schemes |
xv.  | To deal with municipality/state |
xvi. | To put your voice in the community |
xvii.| To take care of children while working |
xviii.| To meet your nutritional needs |
xix.  | To minimize your debt |
xx.  | To improve savings |
xxi. | To get occupational training |
xxii.| To preserve your culture |
xxiii.| To maintain your equipment |
ANNEXURE 4

CONSENT FORM

A study to understand the livelihood struggles of Koli women

Namaskar, I am Bhagyashri Mundhe, a student of Tata Institute of Social sciences in Mumbai. I am doing PhD to understand the Livelihood struggle of Koli women and their coping strategies to deal with these struggles. I am willing to take your interview to understand your day-to-day practices in fisheries business and what are the various difficulties you face with it. I want to convey your voices who are working on women in traditional livelihood practices (fisheries and other). Anything that you and your family member tell me will be confidential. Your name, identity, address will not be announced or published. None other than me will be able to locate you and associate to your personal situation or condition. Only after changing the names of all women information will be presented to the any person.

If you consent to share the information about your life and related issues, kindly consent your acceptance to participate in the interview. You can withdraw from continuing the interview, at any point of time, if you are not comfortable or for any other reason. This first session of the interview is likely to take one hour. Followed by that, at convenient time I could continue other sessions. At any time would you like to stop the interview and continue it latter, kindly let me know? You can tell me an appropriate suitable time to begin it. Later or if it is fine now we could have our first session. If you are fine and allow men to record our conversation it would be useful for me. But if you are not comfortable, I will not record the interview. By recording it helps me not to miss any detail you share with me and I can go back and listen to you again to understand better. If you agree and understand what I read out to you in Marathi, consent to share the information about your life and related issues, kindly consent your oral acceptance to participate in the interview.

Thanks for participating in the interview.

Oral consent by the women, Date:.........................(signed by the researcher)

Suggested convenient data/time and venue:..........
ANNEXURE 5

Map of Patwadi and Versova village

Figure 1: Settlement of Versova Koliwada

Source: Versova village trust
Figure 2: Settlement of Patwadi Koliwada

Source: Patwadi Fisheries Cooperative Society

Figure 3: Coastal development (landing centre) on the coast of Patwadi Koliwada.

Source: Patwadi Fisheries Cooperative Society
ANNEXURE 5

Old photographs from the field

Figure: Koli women of Versova taking fish to the market

Source: (Prafulchandra Purandare from Versova)

Figure: Boat landed on the coast after fishing

Source: (Prafulchandra Purandare from Versova)
Figure: Koli man waiting for the boat

Source: (Prashulchandra Purandare from Versova)

Figure: Ferry service to reach Madh Island

Source: (Prashulchandra Purandare from Versova)
Figure: collective fishing by using Pera net

Source: (Prafulchandra Purandare from Versova)

Figure: Fishermen and fisherwomen on the coast of Versova

Source: (Prafulchandra Purandare from Versova)