

CASE STUDY

Case study : India's Disappearing Beaches

The research shows that 40% of India's coastline is vulnerable to **erosion** caused by tampering of it. I learnt the basics of how beaches are made, how natural erosion takes place and how the sand constantly moves along the coast due to the longshore drift and settles to form beach strips.

Puducherry's beach started disappearing in 1986 when artificial harbours were constructed which blocked the natural movement of sand. The **obstruction in the coastline** eventually led to the striping of the coastline and a Seawall had to be constructed in order to prevent the ocean from entering into the city and flooding it. It took only four years for the beach to disappear. Measures were taken to replenish the beaches but once the program was discontinued, a 10km stretch of beach land was lost and 30km continue to erode. Fishermen lost land to keep their boats, pulling up their boats or even drying. Structures which protruded into the sea called 'groins' were also created facilitate small beach formations for boat activities but those in-turn caused more erosion on the other side. The construction of these groins became an endless process and the entire coast has been tinkered with and needs breakwaters to protect Puducherry. It is known that similar methods to save coastal cities have been used in other countries where there is coastal damage. Netherlands use Dykes for flood control and places like Germany, Japan and Mumbai uses tetrapods as **breakwater**.

Therefore, it can be inferred that the tetrapods seen along the Marine Drive which are an iconic sight to Mumbai actually signify **coastal decay** and land loss because of anthropocentric actions. Puducherry should be considered as a warning to Mumbai which is already so prone to flooding.



Source for Case Study :

- <https://www.youtube.com/watch?v=KgTn6Qpgjok&t=631s>
- <https://www.mid-day.com/articles/mumbai-marine-drive-tetrapods-to-get-temporary-nudge/17654169>
- <http://dutchdikes.net/dike-map/>



Image of Tetrapods captured by me during my field visit in Mumbai.

PROBLEMS OF THE KOLI COMMUNITY

I read a paper recommended by Gururaja upon seeking advice from him which describes the numerous socio-economic and climate related issues faced by the Koli community who live in coastal **low-lying areas** of Mumbai which is already very **vulnerable** to problems like flooding and storms. **With the loss of sand beaches fishermen are losing out on spaces to conduct their fishing activities** including dwindling space to dry and sort fish, berth their boats or store equipment. With the rise in global temperatures, their **costs have started increasing** in terms of labour, storage and ice which makes **sustaining** traditional artisanal **fishing difficult as an occupation.**

The fishing villages situated close to the sea are usually not very established areas. The fishermen and their families live in **small houses or shanties** which are not suitable to withstand storms, not big enough to store fishing equipment, nets, containers and boats. Along with being crowded spaces **sanitation is a big hurdle faced by the residents.** Their homes are always exposed to diseases like dengue and malaria as well as chemicals dumped into the sea causing **health hazards.** It was found that the northern coast of Maharashtra is extremely polluted along with petrol contamination found in the creeks.

Source : Senapati, Sibananda & Gupta, Vijaya. (2014). Climate Change, Urbanization and Livelihood Perspective of Indigenous Fishing Communities of Mumbai, India. Present Environment and Sustainable Development. 8. 10.2478/pesd-2014-0029.

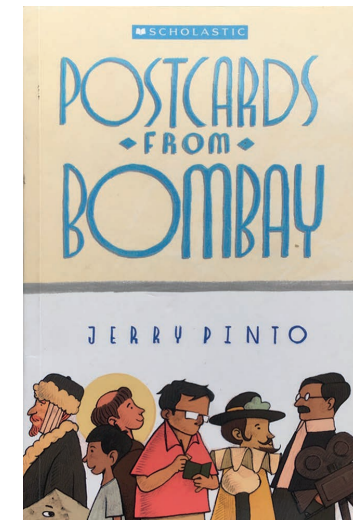
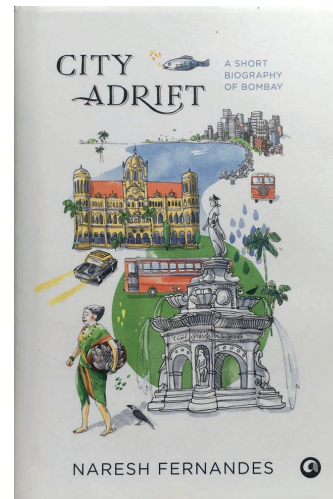
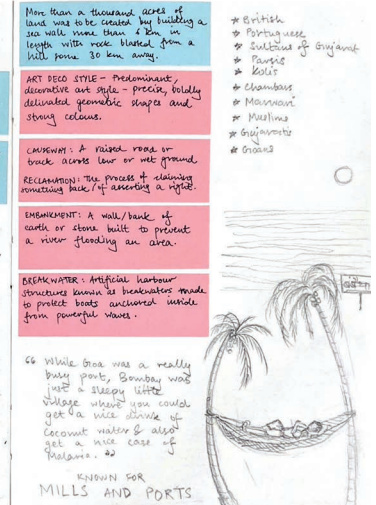
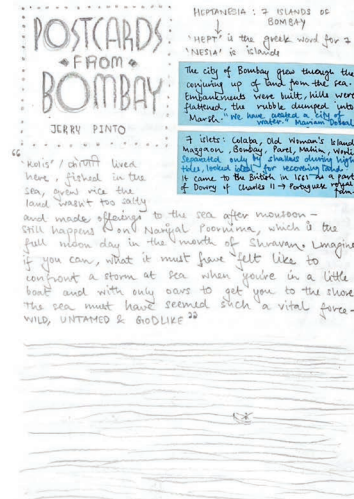
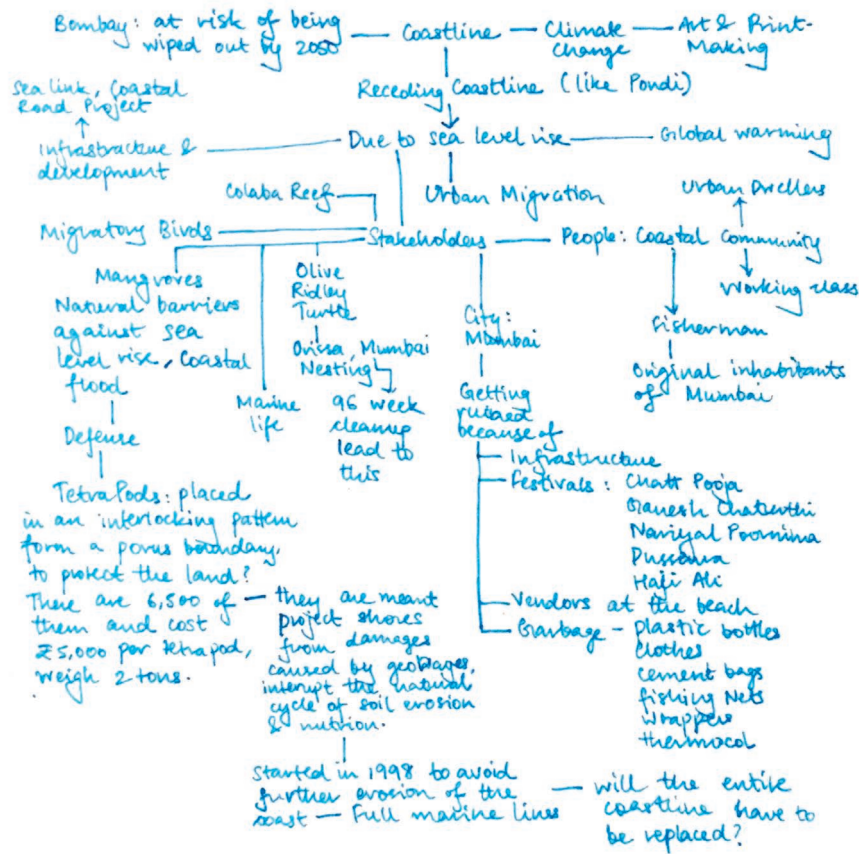
After reading about the problems faced by the Koli Community on a general level I wanted to understand how they will be affected by infrastructure development in particular. I started research about the **Coast Road project and its impact on the coastline of Mumbai** and came across a report by Hussain Indorewala and Shweta Wagh (2015) : Public Good or Private Amenity? A Socio-economic and Environmental Critique of the Coast Road. Some of the points brought up in their report are given below :

- The coastal road will **enclose or alter areas used by the fisherfolk for fishing related activities** mentioned earlier.
- “For example Reclamation is proposed in front of the fish drying areas of Khar Danda village, cutting off its direct access to the sea. There is also the **threat** that these areas will be eventually appropriated for leisure and recreational activities.
- The entry and exit to the northern under-sea tunnel that begins and ends outside fishing villages will require cut and cover entry points – requiring heavy construction and **excavation of beaches.**
- Though the temporary nature of these impacts are emphasized by the EIA, assuming this is true, **what will the fishing communities do meanwhile for their livelihoods?”**

Their report also outlines many other impacts of the effects of the Coastal Road Project. source : <https://csainquiry.files.wordpress.com/2015/10/report-on-socio-economic-and-environmental-critique-of-the-coastal-road.pdf>

UNDERSTANDING MUMBAI

I mapped out my research about the different aspects of Climate Change with regards to Mumbai. To understand Mumbai as a subject better, I read two books which presented the flavour of Mumbai.



INTERVIEW WITH A JUHU RESIDENT : KALPANA AGARWAL

- She has been living at the by the beach side for the past 30-35 years after living in Delhi for the first few years of her life.
- She had never seen the beach before this and marveled at the sight of the sand and water landscape as she didn't know what it was.
- Bombay used to look like Goa a few years ago with small bungalows and coconut plantations. These homes were usually small weekend homes.
- The entire region of Centour Hotel (now known as Tulip Star) as well as the plot of J.W. Mariott used to be a coconut plantation.
- The heat has increased drastically in the past few years.
- When monsoons come the level of garbage is the most. Everything stinks- it feels like Dharavi Slums.
- Many **oil spill** incidents have also occurred in the sea surrounding this land
- You could walk on the beach barefoot until 1982 but not anymore since there are many broken glass pieces found in the sand of this beach. The drug racket grew in Mumbai causing there to be glass bottles, pieces and syringes as garbage which was often dragged in and out by the sea.
- One cannot walk in the water anymore.
- She doesn't understand why permissions to overload the coastline are given.
- The Juhu Beach is cleared at least once a day and that is a great thing!
- The stalls of food and drinks really need to start having proper ways of garbage disposal like the presence of dustbins in every shop.
- Naariyal Poornima is celebrated towards the Koliwada side.
- The smell of fish as the wind direction changes is very bothersome.
- There was once a dead whale that had washed up on the beach.
- Clean beaches are essential and much needed.
- A childhood memory she remembers is playing on the beach and collecting fish (the water was very clear, fish were close by) in coconut shells and taking them home- only to be scolded by their mother.
- She finds many excuses to not go to the beach these days.
- Coconuts tree are almost non existent compared to a few years ago where there were coconut plantations.
- She thinks there should be a **ban on plastic**.
- The fisherman have lost a lot of business so the government should give them compensation.**
- There was a time when the water from the sea would come onto the road.