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Logistics Sector as an Alternate Career Option for Fisherfolk Community in the Eastern Coast of India

An Exploratory Study

by Anusha Pant and Sajid Ali

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Background to Coastal Fishing

The Indian Coastline

India is endowed with a coastline of 7,517 km of which 5,423 km is of mainland and 2,094 km is of island territories. Indian mainland is surrounded by the Bay of Bengal in the East, Arabian Sea in the West and Indian Ocean in the South. The mainland coast consists of nearly 43% sandy beaches, 11% rocky coast with cliffs and 36% muddy flats and 10% marshy coast.

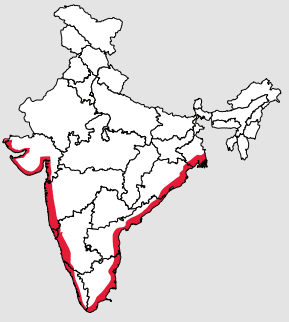


Figure 1: Indian Coastline map

Geographically, the coastline of the country is fairly straight and regular owing its formation due to continental drifting of the ancient *Gondwanaland* during Cretaceous period. Such a long and regular coastline is of great advantage to the country, because:

1. From the national security view point, it provides a natural boundary to prevent any hostility from neighbours.

2. It provides an access to trade and commerce through one of the cheapest forms of transport i.e. by sea.

3. It provides for various mineral resources such as oil and natural gas to be extracted from sedimentary rock formations (Krishna-Godavari Basin), *monazite* to be extracted from coastal plains of Kerala, *ilmenite* from Visakhapatnam etc.

4. It provides opportunity for a vast coastal community to fish in the surrounding oceans.

5. The coastal plains have fertile soils on which rice and coconut; plantation crops like rubber, coffee and tea; spices like cardamom, cloves and black pepper etc. are grown.

6. Coastal belts are also popular destinations for local, national and inter-national tourists making tourism an important industry in the region.

A total of nine states and four Union Territories (UT) fall in the coastline of the country. Gujarat, Maharashtra, Goa, Karnataka, and Kerala exist along the western coastal belt of the country. Tamil Nadu, Andhra Pradesh, Odisha and West Bengal fall in the eastern coastline. Daman & Diu, Puducherry, Andaman and Nicobar Islands and Lakshadweep Island are the UTs that share a boundary with the sea. There are in total 3477 marine fishing villages[1] distributed across nine coastal states and four UTs. The highest number of marine fishing villages are present in Odisha (739) followed by Tamil Nadu (575) and Andhra Pradesh (533). There are in total 1,363 landing centers[2] with the maximum in Tamil Nadu (349), Andhra Pradesh (234) and Kerala (174).

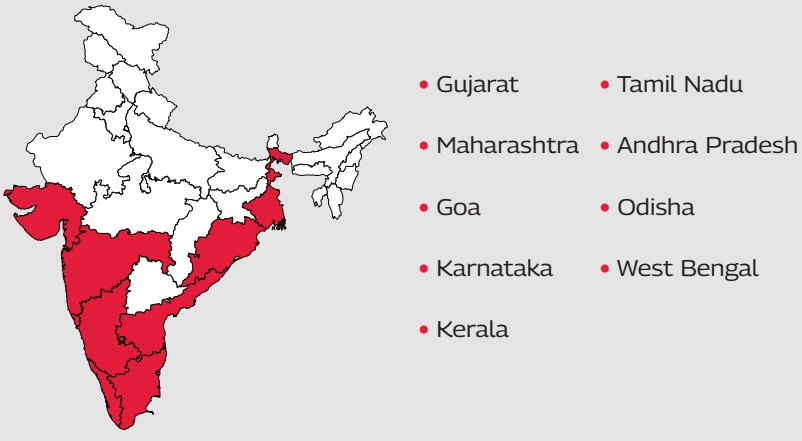


Figure 2: Indian Coastal states

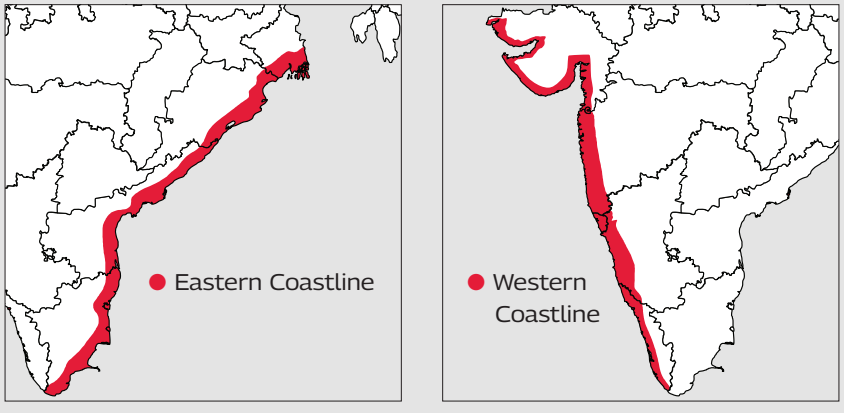
Eastern and Western Coastline

The Eastern and the Western coastline of the country are characteristically very different. The West Coast, stretching from the Rann of Kutch in Gujarat to Kanyakumari in Tamil Nadu exists as a narrow strip (10-80 kms width) of land between the Arabian Sea and the Western Ghats. It has an elevation ranging from 150-300 meters AMSL (Above Mean Sea Level). The total length of the Western coastline is about 1400 kms, wherein Gujarat covers a major area of 1215 kms. It is divided into the coastal plains of Gujarat; Konkan coast of Daman in the north; Maharashtra and Goa in the south; North Kanara coast of Uttar Karnataka and South Kanara coast of Udupi and Mangalore; and extending further towards the Malabar coast of Goa, Kerala and Tamil Nadu. Estuaries and lagoons are a common feature in the submerging coastline.

[1] An assemblage of houses/ dwelling place where marine fishermen live, which is recognized by state fisheries department. A settlement of households which comes under a separate village-panchayat is a Hamlet.
[2] The place or harbour where fishermen land their fishing craft with catch.

The East coast, on the other hand, is an emergent coast with deltas commonly found. It stretches from Kanyakumari in Tamil Nadu to the Sunderbans in West Bengal. It is a broader belt of plains (80-100 kms width) between the Eastern Ghats and the Bay of Bengal. It is divided among the Coromandel Coast in Tamil Nadu and Andhra Pradesh, Northern Sircar Coastal plains of West Bengal and the Utkal plains of Odisha. It is a sandy coast with straight shorelines and receives rainfall during the North East monsoons. Cyclones, typhoons and local storms are more prevalent in this part of the coastline.

Figure 3



East Coast of India-features, industries and significance

The East coast of India is 33% of the total coastal length of the country (3033 kms). It has a total of 777 landing centers and 2112 fishing villages (61% of the total). It is a relatively fertile ground for cropping and allied activities owing to the fact that almost all peninsular rivers flow eastwards and drain into the Bay of Bengal. These rivers carry heavy alluvium which consists of various minerals deposited along the way especially at the mouth of the sea, thus creating huge deltaic deposits. Rivers like Krishna, Godavari, Cauvery, Mahanadi, Subarnarekha, Vaigai, Brahmani, Pennar are the major rivers that flow through this region.

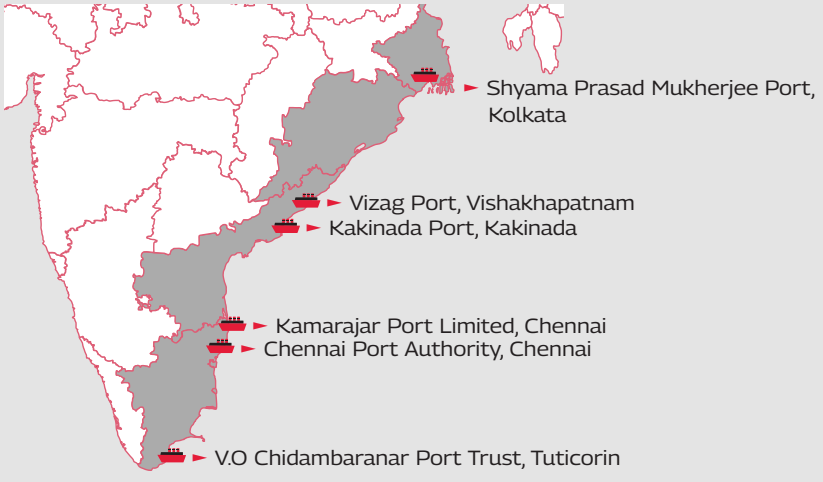
The eastern coastal plains have been distributed as Utkal Plains, Andhra Plains and Tamil Nadu Plains in the states that they lie. Utkal plains are present in Odisha and harbours the Mahanadi Delta. The most prominent feature of this plain is the Chilika Lake which is the biggest lake in the country with a maximum recorded area of 1144 sq km in the monsoon months. The Andhra Plains are present in Andhra Pradesh and has a vast deltaic formation of the Godavari and Krishna rivers. Tamil Nadu Plains stretches for 675 km from Pulicat Lake in the north to Kanyakumari in the south, river Cauvery forms a delta where the plains get 130 km wide. It is supposed to be the granary of South India considering heavy alluvial deposition of the river in the area.

Massive deltas formed by rivers in the Eastern coast of the country are known as the rice bowls of South. Tamil Nadu and Andhra Pradesh together account for 23% of the gross cropped area of rice in the country. Vast expanse of sea having rich marine and mineral resources is also a source of income and activity among the communities living in these plains. The eastern coast has a resourceful coastal community thriving on marine fishing, artificial shrimp cultivation and related occupations in fishing industry. The Eastern coastline lack indentation due to which there are hardly any natural harbours except Visakhapatnam and Machilipatnam. Incremental elevation as one goes from shore line towards the mainland showcases serene parallel shores and hillocks, making for a vital tourist activity in the region. Most shore cities boast of both tangible and intangible culture. Cities like Kolkata, Chennai have witnessed commercial activity since pre-independence days. Temple towns of Madurai, Chennai, Mahabalipuram, Puri, Konark, Rameshwaram etc. also lie on this side of the coastline.

The major ports of the region are Kolkata (Syama Prasad Mukherjee Port), Visakhapatnam, Kakinada, Chennai, Ennore (Kamarajar Port), Tuticorin (V.O. Chidamabarnar Port). These are gateways to sea commerce and trade. They facilitate trade in various agricultural commodities, textiles, manufactured goods, etc. in and out of the country. Special Economic Zones (SEZs) along these major ports have established a platform for investors to come in for infrastructure development, employment and avail tax benefits.

The Government of India, considering the strategic importance of eastern coastline along the length and breadth of the country, has identified the East Coast Economic Corridor (ECEC) in order to stimulate growth of the region by integrating industry, urbanisation, infrastructure, logistics through efficient transport by land, railways and sea. It aims to create jobs in manufacturing and service industry in the region.

Figure 4: Major Ports



It is a part of the ambitious Sagarmala project of the government to develop the coastal economy by transforming ports, building industrial clusters along the ports and inland logistics. ECEC aims to leverage India's gifted coastline, large network of ports and expanding maritime industry to develop maritime transport hubs along the eastern coastline of the country. International maritime trade through these ports would open up opportunities to explore and nurture the global value chains for industrial development, high value jobs creation, standardisation of goods and services and socio-economic prosperity.

On a different note, the Eastern coastal belt is also more prone to storms. As per the data from National Cyclone Research Management Project (NCRMP), about 308 cyclones have struck the Indian Coastline from 1980 to 2000, of which only 48 cyclones crossed the western coast during the peak stormy season (May to June and October to December). 58% of the cyclones are formed in the Bay of Bengal while only 25% develop in the West lying in Arabian Sea[3]. The reason for this is the formation of greater depression zones in and around the Bay of Bengal where the average temperature lurks at 28 degrees and fresh water draining from multiple river system further causes temperature rise and further depression. Cyclonic winds from other water bodies are carried by the Bay of Bengal and missing landmass in the bay causes these winds to consolidate towards eastern coastline to cause storms and rains.

[3] *Cyclones & Their Impact in India - NCRMP, n.d., para. 3*

Fishing Industry in India

Fishing is termed as the 'sunrise sector' of the Indian Economy with the highest average decadal growth of 8.9% (2014-23) among agriculture and allied sectors of the economy. India is the world's third largest fish producer after China and Indonesia, and the second largest aquaculture nation. It boasts 8118 kms of marine coastline with 3477 fishing villages, 1547 traditional fish landing centers, 7 major fishing harbours, 63 minor fishing harbours. The marine fisheries potential is estimated at 5.31 Mega Tonnes (MT) against the 4.4 MT harvested in 2022-2023. Inland fishing production is 13.13 MT, which is about 77% of the estimated potential. About 60-75% of the India's marine capture fish comes from the country's west coast. It contributes 7% to the global fish production. It is home to more than 10% of the global fish biodiversity and is one of the 17 mega biodiversity rich countries[4].

As per the National Bureau of Fish Genetic Resources (NBFGR), there are 1518 marine fish species, 113 brackish water fish species, and 877 freshwater fish species found in India[5]. In addition, some 291 exotic fish species are also found here. Extensive coastline with the Exclusive Economic Zone (EEZ) of 200 nautical miles into the Indian Ocean encompassing more than 2 million square kilometers and broad continental shelf region of 530,000 sq kms provides for the vast marine fisheries resources[6]. In addition, 14,000 sq. kms. of brackish water, 16,000 Sq. kms. of freshwater and 64,000 kms of rivers and streams provides for fish production.

[4] *Fisheries Statistics Division, Department of Fisheries, 2022, p. 1*
[5] *Uttam K Sarkar, et al, 2012*
[6] *Najmudeen, 2023, p. 1*

The total fish production during the year 2022-23 was recorded at 174.45 lakh tonnes, of which 44 lakh tonnes came from marine resources and 131 lakh tonnes came from inland fisheries. 50 different types of fish and shellfish from India are exported to over 70 countries of the world. Exports of 1.73 million MT (Mega Tonnes) of seafood worth USD 8.09 billion was recorded in 2022-23, which is an all-time high by value[7]. It accounted for 10% of the total exports from the country and about 20% of agricultural exports. Effectively, it contributed about 1% to the GDP and 6.72% to the Agriculture GVA of the country. It generated export earnings of Rs 334.41 billion for the country. USA has been the most valued export market for marine products in the year 2022-23, with goods valued worth USD 2.63 billion exported, followed by China (USD 1.5 billion) and European Union (USD 1.2 billion).

Disposition of fish catch in India increased to 171.13 lakh tonnes in 2022-23 from 160 lakh tonnes in 2021-22[8]. Andhra Pradesh, West Bengal, Karnataka and Odisha have the highest fishing disposition.

Andhra Pradesh (51.06 lakh tonnes), West Bengal (21 lakh tonnes) and Karnataka (12.25 lakh tonnes) were the biggest fish producers of the country in the year 2022-23[9]. Gujarat, Karnataka, Tamil Nadu and Kerala are the biggest grounds for marine fishing while Andhra Pradesh and West Bengal are far ahead of the other states in inland fish production[10].

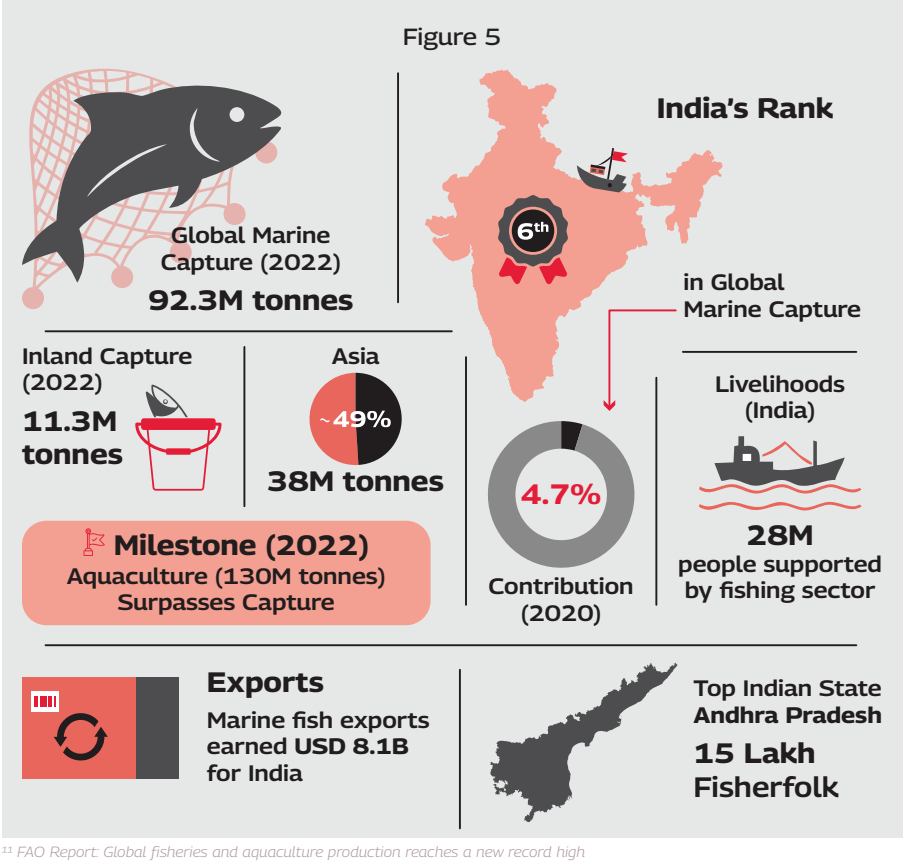
[7] *Ministry of Commerce & Industry, 2023*
[8] *Fisheries Statistics Division, Department of Fisheries, 2022, p. 3*
[9] *Fisheries Statistics Division, Department of Fisheries, 2022, p. 22*
[10] *Fisheries Statistics Division, Department of Fisheries, 2022, p. 48, 49*

Marine Fishing Subsector

Marine fishing is a part of the capture fishing sector along with capture from inland resources. In the year 2022, the capture fish production was 92.3 million tonnes with inland capture fish contributing 11.3 million tonnes. In the same year, Asia produced 38 million tonnes of marine capture fish, accounting for nearly 49% of world's marine capture. This was also the year when global aquaculture fish production (130 million tonnes) surpassed global capture fish production (92.3 million tonnes) for the first time[11]. India holds the 6th position in global marine capture fish production with a contribution of 4.7% in 2020[12]. Marine fish exports earn foreign exchange worth USD 8.1 billion for the country[13].

Fishing contributes a lot to the coastal economies. It not only provides livelihood opportunities for the communities directly involved in fish catching/culture but also creates income generating opportunities for the actors involved in the entire livelihood and value chain. As per an estimate, around 61.8 million people were employed in primary sector of fisheries and aquaculture in 2022, down from 62.8 million people in 2020[14]. The sector holds immense importance to the traditional fishermen who have been catching fish for their subsistence and food security. This sector supports livelihood of around 28 million people of the country providing both income and employment. Andhra Pradesh leads the states in total number of fisherfolk, with around 15 lakh people involved in the sector, followed by West Bengal, Tamil Nadu, Gujarat and Karnataka.

Figure 5

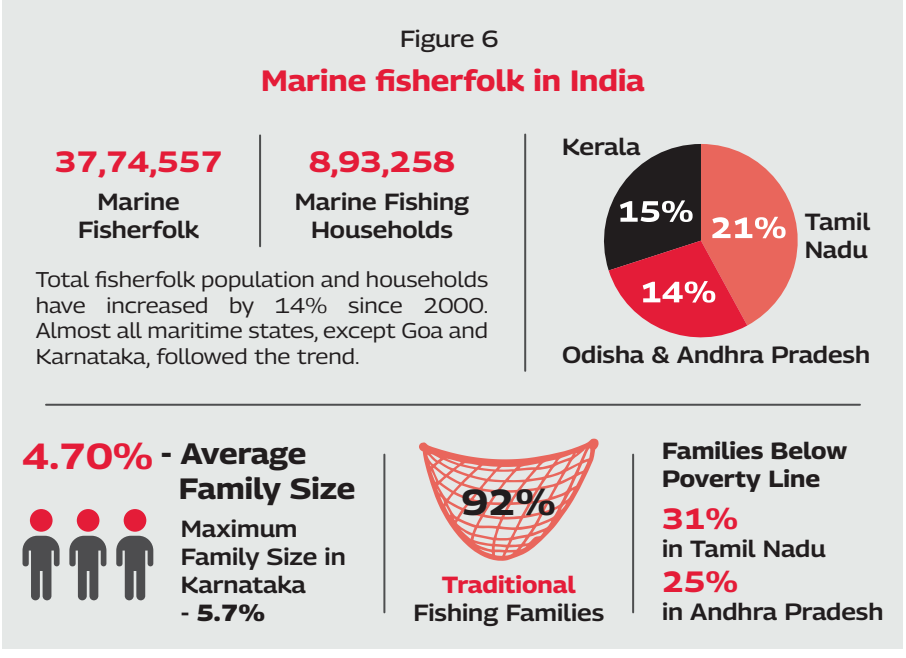


[11] FAO Report: Global fisheries and aquaculture production reaches a new record high
[12] Overview of marine fisheries of India - CMFRI Repository
[13] Najmudeen, 2023, p. 1
[14] FAO, 2024, pp. 21-22

Marine Fishing Community- an Overview

A brief background to the marine fisher folk communities would provide a background to the study and its subject. As per the Marine Fisheries Census, 2016[15] there were 37,74,557 marine fisherfolk residing in 8,93,258 marine fishing households. The total fisherfolk population and households have increased by 14% since 2000. Almost all maritime states, except Goa and Karnataka, followed the trend. The average family size of these marine fisherfolk households is 4.70, with the maximum family size in Karnataka being 5.7. Out of the total fishermen population, 21% were in Tamil Nadu 15% in Kerala, 14% in Odisha and Andhra Pradesh. 92% of these families were traditional fishing families. It is also important to note that 67% of these fishing families were below poverty line. 31% of them resided in Tamil Nadu and 25% were in Andhra Pradesh.

Figure 6



Male and female constituted almost equal percentage of total population involved in fishing. 52% of male and 48% of the female population were involved in fishing. Out of the total fishing families, 2,01,855 were in Tamil Nadu (23%), 1,55,062 in Andhra Pradesh (17%) and 1,21,637 in Kerala (14%) (CMFRI, et al, 2020, pp. 33).

The fishing folks are categorised in either full time or part time work, depending on the dependency on fishing as a source of livelihood for them. 38% of marine fisher folk were engaged in active fishing with 83% of them having fulltime engagement. Only 2% of the fisher folk were engaged in fish seed collection, 57% of which were women (CMFRI, et al, 2020, pp. 52). Tamil Nadu, Odisha, Andhra Pradesh and Kerala had the highest percentage of full-time fisher folk.

[15] *Marine Fisheries census is a periodic survey of the marine fishing population, their social, economic and educational status across 3,477 marine fishing villages and landing centers in all 9 maritime states of India and 4 UTs. It was conducted by the Central Marine Fisheries Research Institute, Kochi.*

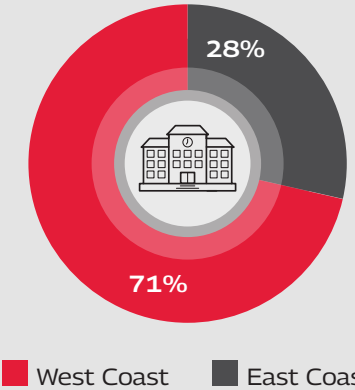
Traditionally, small scale marine fishing was practiced among the coastal communities using indigenous crafts and gears, which over time, saw improvements in terms of mechanisation of crafts and use of advanced equipment. As of 2016, of the total 27 lakh registered fishing crafts, 59% of the fishing craft in the Indian Fisheries were motorised, 26% were mechanised and while only 15% were left non-motorised. Tamil Nadu had the highest percentage of fisher folk owning motorised fishing craft followed by Andhra Pradesh, Kerala and Gujarat. Odisha on the other hand had the highest percentage of fisher folk having non-motorised craft[16].

Socio-Educational and Economic Status of marine fishing community

While coastal fishing communities have fairly good access to healthcare, infrastructure and communication facilities, education is something that has been neglected over all these years. Nationally, 66% of the marine fisher folk have primary level or higher level education while 34% have never been to school. Andhra Pradesh has the highest number of unschooled fisherfolk (60.1%) while only 15% of the fisherfolk in Kerala are unschooled. Amongst men, about 40% were uneducated while 36% of the females were uneducated[17].

It is also found that fisherfolk belonging to BPL families had a family size below five members whereas families above poverty line had 8-10 members in the family. People living in larger and younger households were typically poor[18]. As per Lipton and Ravallion (1994), income per person is low in households with larger family size. On an average one fisherfolk supports two persons. The child dependency ratio (140) among the marine fisherfolk of India was much higher as compared to aged dependency (57). Dependency with respect to employment in fisheries was highest for the UT of Daman and Diu and low for states of Maharashtra and Andhra Pradesh.

Figure 7: No. of Technical Institutions



When we look at the presence of educational institutions in fishing villages of India, we find that primary schools are present in almost all 9 maritime states with the highest number in West Bengal, Odisha and Maharashtra. Secondary schools are also almost ubiquitous in every fishing village with the highest percentage in Maharashtra, Kerala and West Bengal. Colleges have a rare presence in these states and technical institutions have almost negligible presence. There are 158 technical institutes across all nine coastal states, a visual representation between the Western and Eastern Coastline is provided across[19].

[16] CMFRI, et al, 2020, pp. 34
[17] ibid, pp. 33
[18] Rao et al., 2016, pp. 3-4
[19] CMFRI, et al, 2020, pp. 77

The income levels of the small-scale participants in marine fisheries are also limited. Majority of the small-scale fisher folk have annual earnings below Rs. 25,000 (CMFRI, et al, 2020). This could be on account of several factors such as high costs involved, reduced ownership of drafts, prevalence of costly debts, increasing lean periods, lack of alternative income options during lean periods etc.

Challenges and Vulnerabilities of Marine Fishing Community

As per an article published in Conservation India, in a study conducted to collect and understand perceptions of fisher folk on fishing in the states of Tamil Nadu and Maharashtra along the eastern and western coast respectively, 85% of the marine fisherfolk reported decline in fish catch[20].

Source: Freepik

Demand Supply Gap

Global marine capture fisheries production has increased by 14% from 1990 to 2018, while there has been a 122% rise in total fish consumption in the same period[21]. Therefore, the rise in total fish consumption is way more than the capture fish production. In addition to the demand supply gap, there are a number of limitations such as value chain inefficiencies, limited value addition, inadequate post-harvest handling and inadequate market linkages that affect the profitability of the sector and income of the fishing communities.

[20] *Karnad & Karanth, 2016*
[21] *FAO, 2020*

Deterioration of fish stock

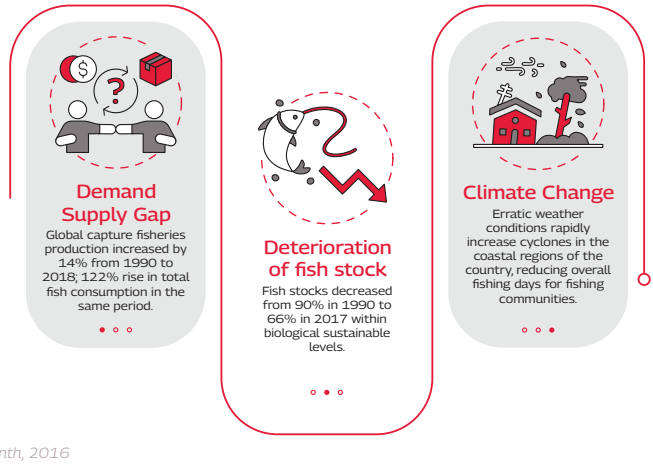
Fishing and particularly, marine fishing resources are common goods, access of which is free and open. It is, characterised by issues around common property such as ownership, exploitation and conservation. In areas lacking fisheries management, fish stocks are poor and decreasing every passing day. Over exploitation and capture of juvenile fish decelerate rejuvenation and recharge. Human induced pollution and global warming has reduced the phytoplankton population under the sea, which creates an imbalance in ocean food web and hence a reduced fish catch. Fish stocks within the biological sustainable levels has decreased from 90% in 1990 to 66% in 2017 (Gatta, 2022).

Climate Change

Extreme and erratic weather patterns, extended rainy seasons, rising sea levels and pollution is taking a toll on fish catch, income and overall profitability of the sector. This is especially so in the areas with high urban influence combined with enormous population and pollution pressure on marine resources. In 2019, India's Western Coast witnessed its lowest catch in 45 years with a 32% decrease from the previous year (Kajal, 2020). Such weather conditions are leading to increasing cyclones in the coastal areas of the country, thereby, reducing the overall fishing days and income opportunities for fisher folk. As per a study in the journal Climate Dynamics, there was a 52% increase in cyclonic activity in the Arabian Sea from 2001 to 2019 (Nandi, 2021). In 2019, fishing communities claimed to have suffered a loss of almost 50% in their annual fish catch due to reduced fishing calendar days on account of tropical cyclones[22].

Melting ice caps and sea water expansion are causing sea levels to rise and take over land, especially near shorelines. As per a study carried out by National Centre for Sustainable Coastal Management (NCSCM), one third of all the beaches in India are under the pressure of erosion due to rise in sea level[23]. These shoreline changes were a combined effect of natural and human activities which would adversely affect the livelihoods of fishing community living in the vicinity. The shoreline assessment by the National Center for Coastal Research in Tamil Nadu found that nearly 14% of Tamil Nadu's coastline is occupied with artificial structures. These structures accelerate coastal erosion and accretion (Srimathi, 2024).

Figure 8



[22] Karnad & Karanth, 2016
[23] Ministry of Environment, Forest and Climate Change, 2023

Overcapacity and competition

In India, over a span of 70 years, marine fish catch increased considerably from 0.6 million tonnes in 1950 to 3.5 million tonnes in 2023[24]. The fishing equipment and crafts also became sophisticated with both motorised and mechanised boats outnumbering the traditional crafts. Overcapacity is an issue in capital intensive mechanised fishing and labour-intensive motorised fishing. As per Dept of Animal Husbandry, Dairying and Fisheries (DAHDF), 2018, optimum number of different types of fishing craft required was 76,967. However, 1,66,333 operated, which is almost double the required number[25].

While there has been an increase in fisherfolk population over the years, the total labour force requirements in the country for fishing operations using various crafts gear combinations were met from non-fisherfolk population. The labour power requirements for motorised sector decreased from 63% in 2005 to 57.6% in 2010, and mechanised sector increased from 25.5% to 30% in the same period. A drastic decrease of 50% in labour force requirement was seen in traditional non-mechanised fishing sector during this period. The active fisherfolk in 2010 were 71.2% of the total 13.02 lakh required for operating fishing fleets at an optimum level[26]. This indicates the need to bring in sustainability into marine fisheries by maintaining optimum number of fishing fleets by reducing their number.

Policy restrictions on fishing

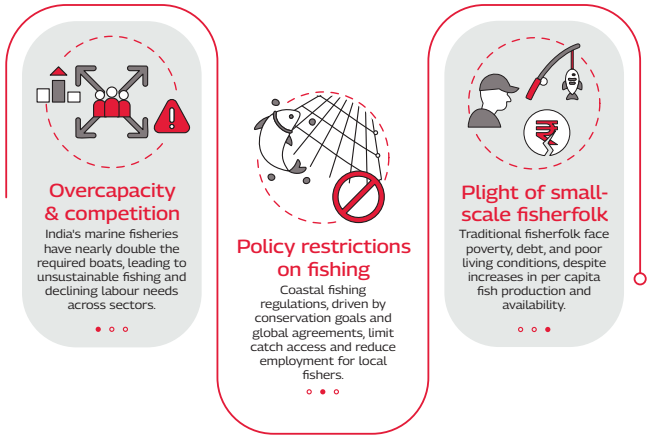
90% of the fish stock is captured at 50 mts depth around coastal waters. Most fishing vessels whether subsistence or commercial try their luck in capturing fish stock in this localised periphery and depth. Increased competition for fish capture due to geopolitical restrictions along with increasing demand and consumption of fishes has led to overexploitation of fish species. Juvenile capture of fish leads to an imbalance in sustaining fish species and fish stock. Considering this, the Government of India has taken policy measures to restore and rejuvenate marine ecosystem. Besides the national interests and requirements, policy interventions are driven by international agreements on restrictive and responsible fishing. It is also important to note that state governments are responsible for regulating fishing upto 12 nautical miles from the shoreline while beyond this and up to 200 nautical miles, which is the Exclusive Economic Zone, is subject to central command[27]. Regulations on mesh size of nets, fish catching limits, mode of fishing, licensing and leasing of fishery, declaration of comprehensive 61 days fishing ban are few such measures. Owing to restrictions and regulations in exploiting fish resources in India, fishing communities are increasingly finding it difficult to keep up with the demand of fish stock for consumption. It also reduces the net employment days for all those involved in fishing and hence reducing the profitability of the industry and individual efforts.

[24] *Najmudeen, 2023, p. 1*
[25] *CMFRI, et al, 2020, pp. 34*
[26] *Fisheries Statistics Division, Department of Fisheries, 2022*
[27] *Ministry of Fisheries, Animal Husbandry & Dairying, 2025*

Plight of small-scale fisherfolk

The small and traditional fisherfolk who have been into fishing for ages and have survived on it are facing immense challenge of continuing into the vocation. With their limited resources and far more uncertain waters and stock, many of these marine fisher folk are dropping out. There are others who are getting trapped into cycle of debt for their financial requirement. As per FAO (2005), globally, there were more than 6 million small scale fisherfolk who earned less than USD 1 a day[28]. 44% of the 99% of the global fisherfolk are involved in small scale fisheries in developing countries[29]. In India, 61% of the marine fishing communities are below the poverty line which is 32% more than the national average. Most subsistence fisher folks come from the Below Poverty Line (BPL) households and most have non-mechanised fishing crafts. Marine fisherfolk involved in fisheries and allied activities at a subsistence level were lagging in most socio-economic indicators. Nationally, 85% of the population lived in *pucca* houses as against only 66% of the marine fishing communities who lived in *pucca* houses. The literacy rate of marine fisherfolk is 17% less compared to the national average. This was same for both male and female literacy rates among fisher folk. Annual per capita fish production by marine fisherfolk has been increasing over the years registering an average increase of 35.6 kg per annum and 167 kg per annum per marine fisherfolk household. Thus, the production capacity of coastal fisherfolk is increasing resulting in the increased availability of 3 kg per annum of marine fish for consumption[30]. The fishing communities however, are not getting directly benefited by this due to inefficiencies in value chain and associated revenue distribution.

Figure 9



[28] *Food and Agriculture Organization, 2018*
[29] *Rao et al., 2016*
[30] *CMFRI, et al, 2020, pp. 33-34*

Coping strategies for Marine fishing communities

The adaptive strategies cannot be executed without the support and intervention of other state actors such as government/non-government/community institutions. Below are some non-specific, broadly applicable adaptive strategies for the marine fisher folk to secure their livelihoods.

Source: Freepik

Fisheries management

Management of marine fish resources, regulation of fishing vessels, their number and operations, and management of both onshore and offshore pollution is key to keep the marine ecosystem thriving and make sure that optimum levels of fish stocks are maintained and extracted. The centre and state governments are responsible for fisheries management of the Indian territorial shores and the EEZ. Legislations such as Indian Fisheries Act, 1897; Merchant Shipping Act, 1958; Marine Product Export Development Authority Act, 1972 have been around to regulate fishing in Indian coastal regions. However, with the increasing focus on responsible fishing and conservation of marine ecosystem internationally, Government of India also came up with Indian Marine Fisheries Regulation Act of 1980, Maritime Zone of India (Regulation of fishing by foreign vessels) Act, 1981 in line with the agenda to protect interest of different sections of people using traditional crafts, conserve fish, regulate fishing on scientific basis, and maintain law of the sea. Governments of the coastal states have also come up with state specific legislations to regulate mechanised fishing.

Combating climate change and adaptive strategies

It is important to understand that challenges such as climate change and associated fish stock slump calls for adaptation by marine fisherfolk. These adaptation strategies should involve multipronged efforts at the end of multiple stakeholders. For example, climate change has a direct association with the deterioration of marine ecosystem and hence has a negative impact on the livelihoods of marine fisherfolk.

But, climate change is something that wouldn't be affected much with measures on behalf of fisherfolk. Instead, fisherfolk must adapt themselves to the climate change associated fish stock depletion. The adaptation strategy against climate change could include investing in technology to reduce cyclone related losses, looking for alternate livelihood opportunities during lean period of fishing associated with harsh weather etc.

In order to combat major issue of erosion of coastlines, a Coastal Regulation Zone (CRZ) notification was brought out by the Ministry of Earth Sciences to conserve and protect coastal stretches and marine areas. It is also to ensure livelihood strategy for fisher folk and other local communities. It also provides a No Development Zone along coastal areas to protect from encroachment and erosion. Under the CRZ, a shoreline management plan is mandated to classify CRZ categories, coastal land use mapping, and socio-economic mapping of coastal communities.

Community engagement and management of fisheries resources

As per a study conducted by Conservation India among the marine fishing communities of Tamil Nadu and Maharashtra, despite the existence of regulatory laws and policies in place, most communities are either not aware or do not comply to the provisions of these laws, making them non-effective. It is observed that government practices fisheries management by promoting industrialisation of fishery, however there are no laws in place to regulate number of fisherfolk or number of vessels for optimum and responsive fisheries management[31]. Effectively, therefore, it is the marine fisher folk community which manages local fishing. The fishing community, also, has been traditionally involved in managing marine fisheries. Involvement of community in decision making would go a long way in ensuring that not just the fish stock is maintained for all but also the fishing community interests are taken care of by and large.

Source: Freepik

[31] *Karnad & Karanth, 2016*

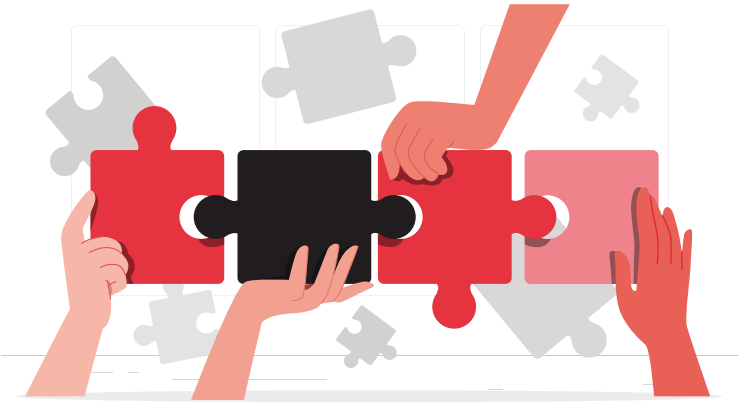
Diversification of livelihoods

Lean fishing time associated with fishing ban due to cyclones, conservation bans, seasonal bans on fishing etc. have been affecting the livelihoods and income of marine fisher folk. This, along with existing inefficiencies in the marine fishing value chain is making the fisher folk especially the generation one up, to recalculate their prospects of taking up their traditional livelihood activity. The current fisherfolk and their families too, would want their children to find better opportunities of income generation. Dropping out of schools is a way of the past as more and more marine fisher families are sending their children to school and about 50% of the fisher folks have studied beyond primary level. They are willing to educate themselves to higher levels provided there are educational facilities available. The affinity for sea and fishing is a given in all fishing families living along the coast and they would want to be associated with the sector for livelihood generation. Increasing opportunities to explore and train in functions like logistics, repair, warehouse management, cargo handling etc. could go a long way in creating alternate livelihood opportunities for these fisherfolk. Besides, promoting aquaculture, coastal tourism etc. could provide alternate income sources for them.

Effective Stakeholder Engagement

Timely and effective intervention by stakeholders such as government, local community-based organisations, civil society organisations etc. could mobilise marine fishing community and local resources to generate necessary coping mechanisms for fisherfolk and their families. The access to education; awareness on government's rules and legislations and social welfare schemes for fisher folk and their families; knowledge on climate change, dangers of juvenile fishing and associated risk for the marine environment should be provided by the local civic bodies, government and non-government institutions in order to draw participatory involvement of the local fishing communities.

A brief overview of government interventions in this regard is provided in annexure A.



Defining Urban Fisher Folk

While the above represent challenges and constraints for the marine fisherfolk as a whole, across regions and locations, there is a dearth of studies on urban fisher folk and their challenges. There are some fundamental differences among urban and rural fisher folk which is primarily due to the region they live and operate. While there is a dialogue around small scale fisherfolk and their families, most of it is rural context. As per the FAO, small scale fishing communities are defined to be found in remote coastal areas[32]. This has been linked to rural regions of the coastal belts where the rural fisherfolk are perceived as vulnerable with limited access to capital, market and services needed to support their livelihoods. Coastal villages, like other parts of the country, are getting increasingly urbanised. Urban towns and habitats have expanded to embrace rural locales and settings. This is increasingly so for the effect of tourism and infrastructure expansion. Urbanisation of rural coastal spaces have come along with positive as well as negative experiences for the traditional fisher folk residing in these spaces. A few challenges faced by these fisher folk include:

Source: Freepik

01 Transition from rural to urban setting

Traditionally, fisher folk have been a tight knit, closed community having strong social and cultural ties. Intervention of government and market has brought increased consumption, expanded infrastructure and restricted land use. Natural resources are getting depleted and access to them are getting limited for the traditional fisher folks to secure their livelihoods. Shorelines are increasingly being converted to tourism sites acting as a deterrent for the fisher folk to go out and fish. With urban expansion, marine fishermen are facing marginalisation in terms of reduced fishing potential of urban coastline due to population and pollution pressure. There is also a pressure on fisher folk to provide for themselves and their families in urban context of increased cost of living.

[32] FAO, 2024b

02 Competition and its adverse effects

Urbanisation of coastal regions usually come up with better infrastructure facilities and services which further attract capital in the form of commercialisation of crafts, mechanised boats, merchandising players and their fleet etc. This makes the average fisher folk to feel the pressure of sustaining his small business. There is a high likely chance that traditional fisher folk will get sidelined for the better off capital intensive fishing businesses. The competition would extend to the ocean where the mechanised fishing vessels and intensive fishing lines would have an upper hand to traditional fishing crafts of small-scale fisher folk.

03 Access to social services

Population pressure often makes it difficult for government functionaries to function for all. With increasing population pressure on limited resources of the urban areas, there is a high likelihood that the poor and marginalised find it difficult to access services provided by the government, further accentuating the inequity. For example, The Chennai Metropolitan Region in Tamil Nadu is a coastal megacity which harboured a population close to 11 million in 2023. However, the resources for the city are not expanding in proportion to the population expansion. This would impact the marginalised coastal community involved in small scale fishing in way that they are overwhelmed with resource crunch, income stagnation and burgeoning expenses of urbanisation.

04 Environmental pollution

Pollution is consequential of urbanisation in most cases. Population pressure, increased consumption, industrialisation and lack of civic amenities for effective disposal of waste is a cause of ocean pollution near urban coastlines. India is the 12th largest waste supplier in the world and over 150 thousand tonnes of solid waste is generated in India per day, less than half of which is recycled and a third of it is discarded to nature[33]. The Meghna-Brahmaputra-Ganges river system discharges 73,000 tonnes of plastic waste into the Bay of Bengal, making it the world's 6th most polluted river system. It is estimated that by 2025, India would be the 5th largest supplier of waste[34]. Most uncollected and untreated waste is likely to find its way to seas and oceans through waterways. Unchecked pollution harmfully impacts the fish stock in such a way that the marine ecosystem and life within it is depleting due to excess pollution.

05 Livelihood Diversification Challenge

The presence of robust infrastructure, improved services and better access to markets which comes along with urbanisation has the potential to consolidate fishing industry and profit margins of the fisherfolk involved. Livelihood options, however, are getting challenging to explore due to opening up of opportunities beyond fishing. Steady income in cash is what is required in urban livelihoods to secure housing, education, health and other services. Livelihood strategy, therefore, for many a fisher folk living in these increasingly commercialised coastal regions seek modification. On one hand, fisher folk would want to engage in secondary and tertiary activities as well, while on the other hand, they would want to explore avenues beyond fishing industry.

[33] *India Solid Waste Management, 2023*
[34] *Sekar, 2024*

Scope of Intervention

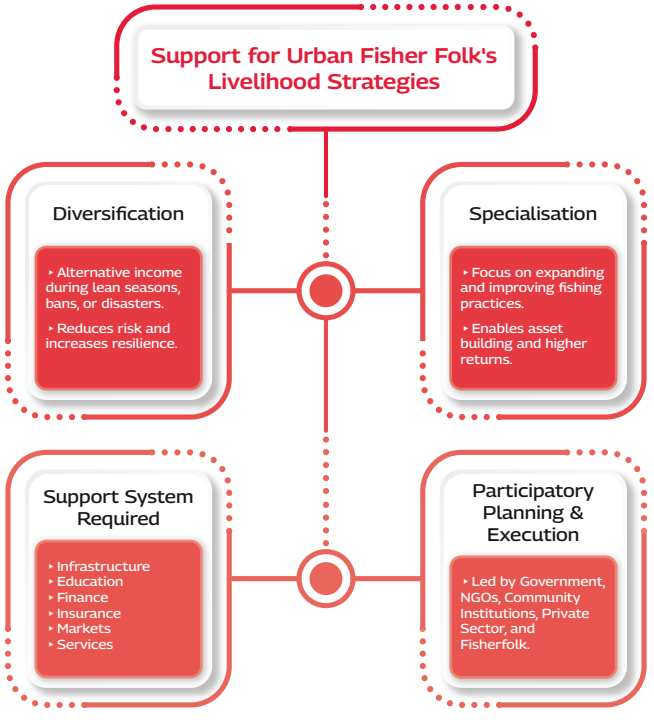
Strategies to support urban fisher folks is important for their livelihood. Concerned stakeholders are advised to adopt both diversification and specialisation strategies to extend their support.

Diversification could help fishing communities as a risk management strategy during lean periods of fishing, natural adversity, government imposed bans on fishing, etc. *Specialisation* can help fisher folk focus on fishing and intensifying their spread and specifics of fishing, which would accumulate assets to explore more remunerative activities within fishing to achieve higher returns.

Both strategies will require a support system in the form of infrastructure, education, finance, insurance, markets and services. Increasing marine fisheries production for the urban fishing communities would also depend on the availability of improved ports, docks, fish cold storage, processing facilities, dependable markets, etc.

Concerned stakeholders as well as the fishing communities together would have to be involved in participatory planning, orientation and execution of the livelihood agenda. Creating opportunities of skilled labour in fishing and non-fishing sectors, and mobilisation among fisher folk in their communities to spread awareness can be harnessed by non-governmental organisations, while concerned government bodies can manage resources for infrastructure, finance and social security.

Figure 10



Exploratory study details

Background

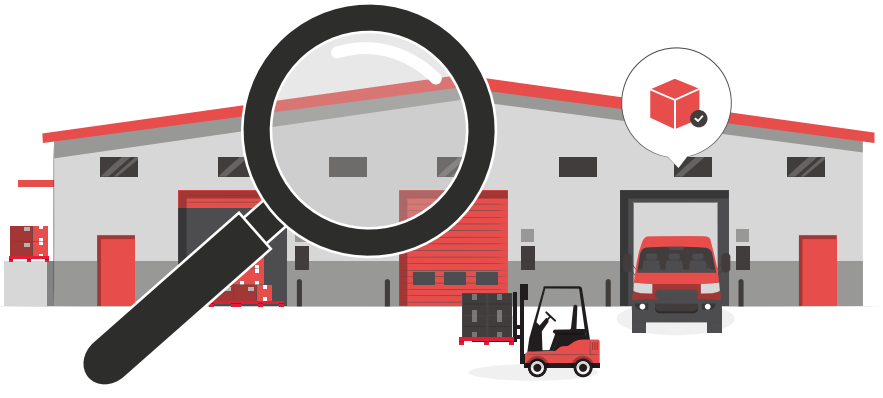
The urbanisation of remote coastal areas is inevitable because of the rapid expansion of urban boundaries. In fact, existing coastal towns are turning into mega cities with their population rise and infrastructural development. To this, the challenges of climate change induced slump in fishing stock, erratic weather conditions, increased government regulation on fishing days and limited income opportunities are making it difficult for the marginal fisherfolk in these regions to continue with their traditional livelihood of marine fishing.

Youth from the marine fisherfolk community are getting increasingly disenchanted with their traditional family occupation. They are often left to witness from distance the rapid urbanisation of their native coastal towns with limited opportunities for themselves. Nevertheless, they have an affinity for the sea and their surroundings which is why they are looking to find steady income and growth opportunities in alternate careers close to their homes.

Tech Mahindra Foundation conducted an exploratory study to understand this context along with the background and career aspirations of youth from the coastal towns of Visakhapatnam, Chennai and Paradip. At the same time, the perceived voids in education and opportunities was considered to find the feasibility of logistics and shipping industry as an alternate career for the youth belonging to fishing community.

To carry out the study, a detailed survey was carried out among the traditional fishing community residing in these coastal towns. A survey tool was developed to understand the background, socio-economic profile, occupation, education level, behaviour drivers and motivation to take up shipping and logistics as a career option and constraints on the same.

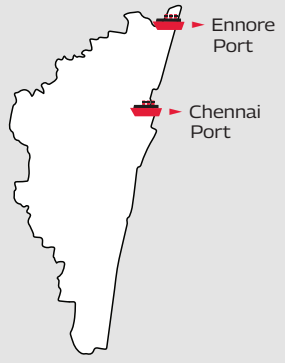
Before we discuss the results of the survey conducted, it is important that we give a background to the cities we selected, our resources and motivation, and finally an introduction to logistics as a career option.



Chennai

Formerly known as Madras, it is the capital and largest city of the state of Tamil Nadu. Chennai is located in the Coromandel Coast of the Bay of Bengal, and is the sixth most populous city and fourth most populous urban agglomeration in India. It has the fifth largest urban economy and third largest expatriate population in India. It is one of the most visited cities in India and 36th among the visited cities in the world. It has a shoreline extending from Ennore Creek in the North to Kovalam in the South. Despite having a natural and long coastline, it is discontinuous and fragmented into stretches. Marina beach and Elliot's beach remain the popular beaches of the city. As per a report from National Center for Coastline Research, Chennai, a stretch of 3 kms along its coast faces slow erosion and 7 kms face low accretion[35].

Figure 11: Chennai ports



The economy of the city is based on automobile, software services, medical tourism, and financial services. Chennai Port and Ennore Port contribute a lot to the economy of the state. The city's economic development is driven by software and business processing industry. Presence of top engineering colleges in Tamil Nadu is the reason for steady supply of human resources to the software industry. It is only behind Bengaluru in generating human resources for IT and IT enabled service industry. The city accounts for 60% of the India's automative exports and has a market share of 30% of India's automobile industry.

The occupational structure of the city has changed over the years with secondary and tertiary sector contributing 98.5% of the occupations in the city. Chennai and the adjoining Kancheepuram districts contribute 26% of employment in organised sector of the state (2002-03). There are 146 fishing villages with one fishing harbour and 64 fishing landing centers in three districts of Chennai, Thiruvalur and Kancheepuram that fall under the Chennai Metropolitan Area. The total fisher folk in the CMA is 1,38,669 comprising about 18% of the total fisher folk of the state. Of these, 18,500 males and 5,500 females are employed in fishing and allied industry. About 5000 mechaniszed fishing crafts, 1931 non-mechanised fishing crafts ply around Chennai coast. About 30,000 tonnes of marine fish is produced in these districts.

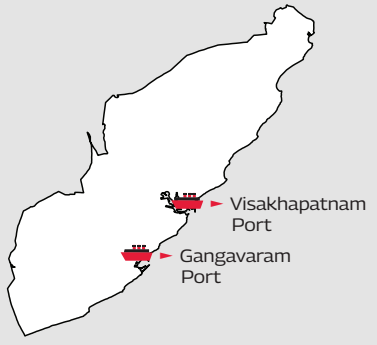
The percentage of workers as per the 2001 census was 55% of males and 18% of females which is bound to increase to 95% males and 40% females by the year 2026. Considering an improvement in education, infrastructure, and service industry, additional jobs would be created in 2026 to cater to 87% of eligible workers of age 16-60 years[36].

[35] *Tejonmayam, 2018*
[36] *Chennai Metropolitan Development Authority*

Visakhapatnam

Visakhapatnam better known as Vizag is the largest and most populous city in the state of Andhra Pradesh. It is the second largest city in the eastern coast of India after Chennai. It is the shipbuilding hub of the country due to the presence of multiple shipyards such as Naval Dockyard, Hindustan Shipyard etc. It has the only natural harbor on the east coast and has the headquarters of South Coast Railways, Eastern Naval Command and has the fifth busiest cargo port in the country. It has a flourishing IT industry as well as pharmaceuticals industry. Jawaharlal Nehru Pharma City developed in 2400 acres land is a dedicated pharma manufacturing zone with companies like Dr. Reddy's, Aurobindo Pharma, Torrent Pharma having their manufacturing units.

Figure 12: Visakhapatnam ports



The availability of manganese and aluminium reserves near Vizag has made a lot of aluminum refineries to be set up here. The city is a part of the Petroleum, Chemicals, and Petrochemical Investment Region proposed between Kakinada and Vizag. The project is expected to generate 1.2 million jobs and would require an investment of Rs. 400 billion. NH 16, a major highway of the Golden Triangle Project bypasses the city with a total of 2000 kms of road network in the region. Vizag airport has also seen an increase in traffic lately with a total 24,000 aircrafts managed in the year 2018.

It has two major port Visakhapatnam port and Gangavaram Port. Visakhapatnam port handled 60 lakh tonnes of cargo in 2016-17 and seafood exporting capacity of the harbor is 2 lakh tonnes[37]. It has container freight stations and inland container depots near the ports facilitating storage and movement of goods. Warehousing sector is also on a boom here owing to the increased demand for FMCG goods, proximity to port and high import-export activity.

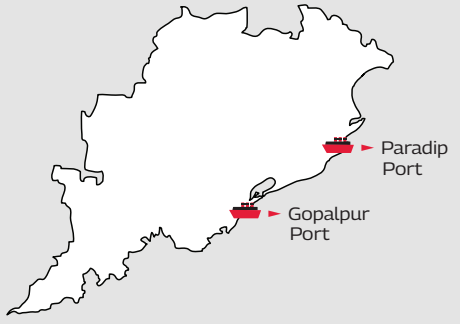
Bhubaneswar*

Bhubaneswar is the capital of Odisha and is modern India's first planned city along with Chandigarh and Jamshedpur. Bhubaneswar and Cuttack are the twin cities of Odisha with a population of 1.7 million in 2011. It lies in the Mahanadi River delta and has rich biodiversity and wetlands of national importance. It has a vast coastline of 480 kms in the east which makes it strategically important for both inbound as well as outbound logistics industry. It has been under the influence of very high damage risk from winds and cyclones.

[37] *Rana, 2024*
** Data for Bhubaneswar was collected from port town of Paradip.*

This is after the 1999 Odisha cyclone which devastated the entire town. In 2014, World Bank ranked Bhubaneswar as the best place to do business. Tourism is a major industry with an influx of average 1.5 million tourists almost every year. In 2011, according to a study conducted by ASSOCHAM, it had the highest rate of employment growth among 17 tier-2 cities, wherein 96% of its workforce are employed in the service industry (The New Indian Express, 2018). It has manufacturing units of companies like Topaz, Britannia group, Bharat Biotech, SMS group etc. Odisha has ample reserves of high quality bauxite, chromite, iron ore, and other minerals. This creates opportunities for industries to flourish in the state. Industries such as iron, cement, aluminum, thermal and wind power are present in the state. Industrial sector is projected to experience a growth rate of 14.5% as per advance estimates of 2021-22[38]. Mining and manufacturing has a lot to contribute to this growth. A good 27% of total workforce is employed in the manufacturing sector which contributes to the high productivity of manufacturing in the state.

Figure 13: Bhubaneswar ports



The state has a wide and far reaching network of railways, roadways, highways and waterways. It has two significant ports for water transportation- Paradip port and Gopalpur port. Paradip port has a capacity of 78 million tonnes and handles coal, gasoline, diesel, fertilizer cargos. It has 20 berths with a draft of 13 meters. Gopalpur port is run under the PPP model which handles cargoes of fertilizer, chemicals, coke and petroleum. It has three berths and 12 meters of draft. IOCL is a major terminal operations manager in Paradip Port with a capacity of 37 million tonnes[39]. Apart from IOCL, ESSAR, IFFCO and PPL, it also manages the terminal operations. Gopalpur port employs 350 individuals with a major demand for forklift operators, reach stacker operators, crane mechanics, painters, blasters, marine engine fitters, and vessel navigators. Paradip port has a high demand for technicians, pump operators, cleaners, carpenters, mechanics, loco drivers, and so on.

The roadways in the states also has a vast network. A lot of development has happened under The Biju Economic Corridor and the Bharatmala Pariyojana encompassing various highway projects and other significant logistics benefits. Railways in the region are trying to connect mining centers to ports for streamlining goods transport and connectivity. Odisha has three major airports along with several airstrips providing regional connectivity. SEZs established near airports put impetus on manufacturing, export and cargo movement.

Bhubaneswar, besides being a hub for eastern corridor traffic and transport, is also a thriving tier-2 city with increasing warehousing demand due to e-commerce traffic and increasing consumer base. Pitapalli cluster is an emerging hub for warehouses with a significant 70% leased spaces occupied by third party logistics. Organized warehousing sector is on a rise and various e-commerce players and 3PL agencies have leased in warehouses in the city and around.

[38] *Planning and Convergence Department, 2018*
[39] *Ali & Hanumat, 2023*

Logistics sector in India

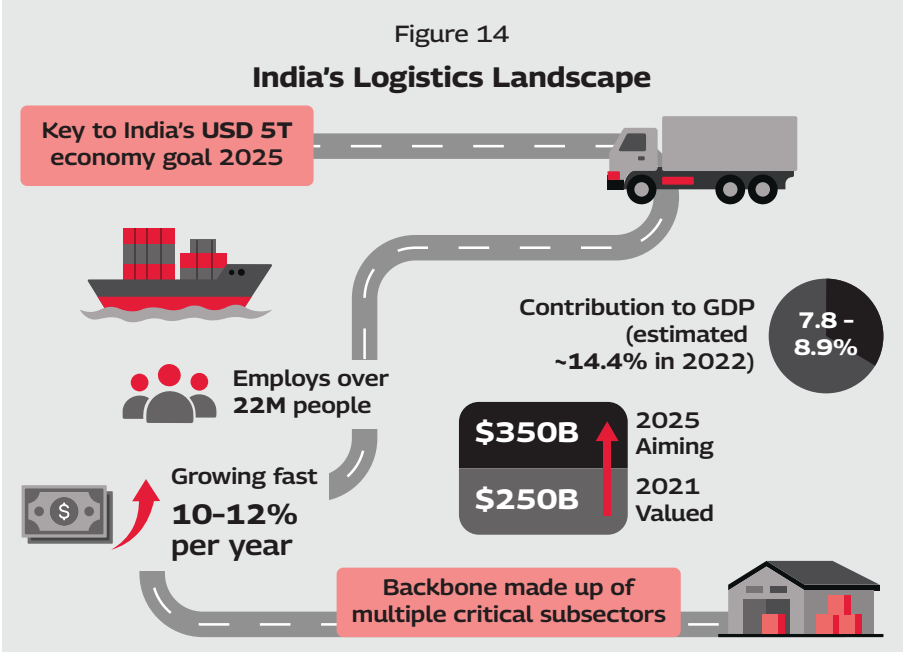
Logistics is the glue that binds almost all sectors of an economy. It refers to the overall process and management of resources right from their acquisition, storage, transportation, handling and drop. Logistics had its origins in the military where it was used for how military men acquired, stored and moved equipment and supplies. Now, it is used in business for how resources are moved and handled along the supply chain. A resource efficient supply chain could mean reduced costs and increased overall efficiency hence affecting the bottom line. Material management in supply chains is getting complex on account of supply chains getting global. Technology comes in as a huge aid to expedite movement of goods and services along the supply chain.

India has a huge logistics sector with immense opportunity to grow. It is a crucial pathway to achieve its vision of being a USD 5 trillion economy by 2025. India's logistics sector is 7.8- 8.9% of the GDP as per an assessment conducted by the National Council of Applied Economic Research (NCAER) at the behest of the Department for Promotion of Industry and Internal Trade (DPIIT). The logistics sector in India is projected to contribute around 14.4% to GDP in 2022 and serves as primary livelihood for over 22 million individuals. The sector was valued at USD 250 billion in 2021 and would become USD 350 billion by 2025, growing at a rate of 10-12% every year (Shweta Singh, 2024). The following subsectors are the pillars of logistics in the country.

India has also shown an improvement in the World Bank's Logistics Performance Index advancing to 38th position among 139 countries. This is credited to the use of technology, data driven decision making, legislative measures to boost the sector and infrastructure focus in the sector. Between the fiscal 2015-16 and 2019-20, India invested USD 10 trillion towards infrastructure development. In order to run the logistics machinery, there exists 37 export promotion councils, 40 Participating Government Agencies (PGAs), 20 government agencies, and encompasses around 10,000 goods and 500 certifications (IBEF, 2023).

Figure 14

India's Logistics Landscape



Transport[40]

66% of the goods are moved on roads, 31% by rail, 3% by ship and 1% by air. To facilitate cargo transport, it has established extensive infrastructure including more than 129 inland container depots, more than 168 container goods stations, and a warehousing capacity of more than 300 million square feet.

The following table indicates in detail the different modes of transport.

Figure 15

Mode of Transport	
Roads	• USD 1.4 trillion has been earmarked for investment in infrastructure by 2025 • The road network in India has expanded from 62.15 lakh kms in FY2021 to 66.71 lakh kms until April 2024 • The road transport is further divided into Full Truck Load (FTL), Part Truck Load (PTL) and Express
Railways	• India has fourth largest rail networks in the world • It handled second highest volume of goods globally • The freight loading capacity of the railways showed an increase of 21.52 MT in 2023 over 2022 • Commodities like coal, iron ore, finished steel, cement, food grains, fertilizers, containers, oil etc, are transported through railways on a daily basis • India is investing Rs 3 lakh crores in the flagship Dedicated Freight Corridor project to enhance efficiency of rail transport
Waterways	• Boasting a coastline as vast as 7500 kms, 12 major ports and 200 minor ports, India's water transport industry manages 65% of the country's trade value and 95% trade volume • The Indian coast is estimated to surpass 250 million tonnes of cargo movement per annum by 2025. The government of India is putting a lot of stress and investment in ports, shipping, inland waterways under Maritime India Vision • Converting half the vessels and equipment used in the Indian ports from diesel to electricity powered by 2030 • 795 million tonnes of cargo was collectively handled across all ports in India in the FY 2022-23, marking a 10.3% growth year on year
Airways	• Primarily focused on highly perishable commodities like medicine, electronics, etc • There are dedicated air cargo to facilitate transportation of specialised items that may not fit passenger planes, and belly cargo movement where cargo is transported in the cargo hold of commercial passenger planes

[40] *IBEF, 2023*

Warehousing

Indian warehousing market is set to attain USD 35 billion value expanding at a CAGR of 16% from 2022 to 2027[41]. Third party logistics partners and e-commerce partners are the major players in warehousing, coming up with innovative models of warehousing and space earmarking in all major and minor Indian cities. Government is investing in multi modal logistics parks to enhance connectivity among all modes.

Besides there are some other value added services in the logistics industry such as custom clearing, inventory management, packaging, forwarding, delivery etc. in both B2B and B2C space. The industry is expected to create 10 million jobs by 2027 owing to robust growth rate of 12% annually[42]. The increase in production has increased demand for logistics services such as transportation, warehousing and distribution. The upcoming trends in industry such as green logistics, real time data collection, digital innovation and transformation, technological application for supply chain orchestration, application of artificial intelligence and machine learning, application of Internet of Things (IoT), application of robotics and automation etc. is to further facilitate jobs in the industry.

[41] *IBEF, 2023*
[42] *Business Standard, 2023*

Careers in Logistics

The Indian logistics sector is driven by policy propulsion, technological adoption and, most importantly, the vast pool of human capital to drive it through. The PM Gatishakti and National Logistics Policy provides framework and infrastructure to drive the logistics sector towards change. Advancing technology and adoption of digital gateways like the Unified Logistics Interface Platform (ULIP) are changing the way logistical processes are managed by enhancing efficiency, reducing costs, delivering quality and optimising supply chains. In 2021, India had 950 million people in the working age bracket of 16-64 years. By 2045, an additional 179 million people would join this group. Around 50% of the working age population comprise the labour force, wherein the unemployment rate is 3.2%, rising to approximately 5% in urban areas. Working Population Ratio is simultaneously high for those with technical education and those with lower levels such as primary education and below[43].

India's potential working population is one of the most important factors contributing to the growth of the economy and the logistics sector in particular. However, there are certain challenges in order to properly harness this potential. One of the most important challenges would be to identify and train the working population in logistics. Measures to introduce training programmes representing industry standards would be essential. Equipping the identified population with necessary skills for the logistics environment along with future changes would be required. In addition, employer branding within the logistics sector should be promoted so as to attract and retain individuals. Improved methods to highlight opportunities for the logistics sector would be crucial in the professional development of employees in the sector.

Careers in logistics include a wide range of options from truck drivers, customer service representatives, dispatchers, freight agents, supply chain managers, transportation analysts, procurement managers, logisticians, operations managers and more. While a degree in logistics and supply chain management is great to begin with, short term courses and training certifications to acquire necessary skills in logistics are also available and well sought for. These courses are convenient, accessible and affordable for aspiring individuals.

[43] *Ministry of Statistics & Programme Implementation, 2023*

Tech Mahindra provides an array of courses in logistics and supply chain management through its Tech Mahindra SMART Academies. The first Tech Mahindra SMART Academy for Logistics and Supply Chain was started in Visakhapatnam in the year 2018. It provides various courses in transportation management, lean chain, strategic sourcing, warehousing, constraints management, supply chain network design, and etc. Various other SMART Academies for Logistics and Supply Chain are also present in Chennai, Hyderabad and Bhubaneswar (Paradip). The flagship courses offered in these academies are Logistics and supply chain management, warehouse management, shipping, warehouse picking and packing, cargo management. All courses are certified by the Logistics Sector Skill Council and Tech Mahindra SMART Academy for Logistics. These courses are available in both online as well as offline mode with a focus on employability skills, expert faculty facilitation, placement assistance and internship opportunities.

The eligibility and career prospects under different courses provided in Smart Academies are as under:

Logistics and Supply Chain Management

Graduate; 20-26 years; Warehouse Operations Executive, Transportation Executive, customer service executive, Purchase executive, Master Production Scheduler, Fulfilment Executive, Supply Chain Executive, Supply Chain Analyst, Inventory/Materials Planner, International Logistics Executive, Documentation Executive, Logistics Coordinator, Shipping Coordinator and so on.

Warehouse Management

Diploma 18-30 years; Warehouse Executive, Warehouse Supervisor, Purchase Executive, Inventory manager, Customer Relationship Executive, Warehouse operations Executive and so on.

Shipping

Any Graduate; 21-35 years; Documentation Executive (Freight Forwarding, Shipping, CFS, ICD), Operation Executive (Freight Forwarding, Shipping, CFS, ICD), Customer Service Executive (Freight Forwarding, Shipping), Sales Executive (Freight Forwarding, Shipping, CFS, ICD).

Warehouse Picker and Packer

Intermediate/ Diploma/ITI; 18-25 years; Warehouse Picker and Packer, Customer Support Associate Warehouse.

Cargo Management

Intermediate/ Diploma/ITI; 18-25 years; Cargo Surveyor, Executive Cargo Handling, Air Cargo Ground Duty Staff, CFS handling.

Results and Discussions

Background

There were a total 386 respondents to the survey conducted in three coastal cities of Bhubaneswar (Paradip) (107), Chennai (142), and Visakhapatnam (136). There were 246 male respondents and 139 female respondents. 295 out of all respondents were from the 18-24 age category, followed by 78 in the 24-30 years, and 10 in the 30-35 years age bracket. Most respondents were unmarried.

Of the total respondents in all cities, 42% belonged to the fishing community, 25% belonged to OBC, 15% to the open category, 15% belonged to SC/ST category and the rest 3% did not prefer to say. For most respondents, their heads of families were employed in fishing (51%), followed by daily wages (29%), private jobs (12%), services (3%) and others (5%). The employment type distribution of the head of the families of respondents across the three cities surveyed is given in the table below. While fishing was the primary occupation in Chennai and Visakhapatnam, it was daily wage labour which was most practiced in Bhubaneswar (Paradip). In comparison to Chennai, private jobs were practiced more in families from Bhubaneswar (Paradip) and Visakhapatnam.

Gender Profile : Only 41% of the 139 females interviewed were employed. Of which, 75% received monthly earnings, while 25% earned daily wages.
Of the total female participants, 57% were from fishing families, 27% from daily wage-earning families, 12% from families primarily engaged in the private sector and 4% did not prefer to say. Within fishing families, over half (52%) of the women were employed. Conversely, only 24% of women from daily wage-earning families had some form of employment.

The demographic distribution of the three surveyed cities - Chennai, Bhubaneswar (Paradip) and Vizag is provided in the next page.

Figure 16: Demographic Breakdown Across Cities

OCCUPATION DISTRIBUTION

	Chennai	Bhubaneswar (Paradip)	Visakhapatnam
Fishing	55%	31.7%	62.4%
Daily Wage	28%	46.5%	14.9%
Private Job	8%	13.9%	14.9%
Service Job	4%	5.9%	1%
Others	5%	2%	6.9%

GENDER DISTRIBUTION

	Chennai	Bhubaneswar (Paradip)	Visakhapatnam
Male	69%	53%	67%
Female	31%	47%	33%

CASTE DISTRIBUTION

	Chennai	Bhubaneswar (Paradip)	Visakhapatnam
Fishermen	52.9%	15.4%	63.9%
OBC	32.4%	15.4%	33.3%
ST	14.7%	69.2%	2.8%

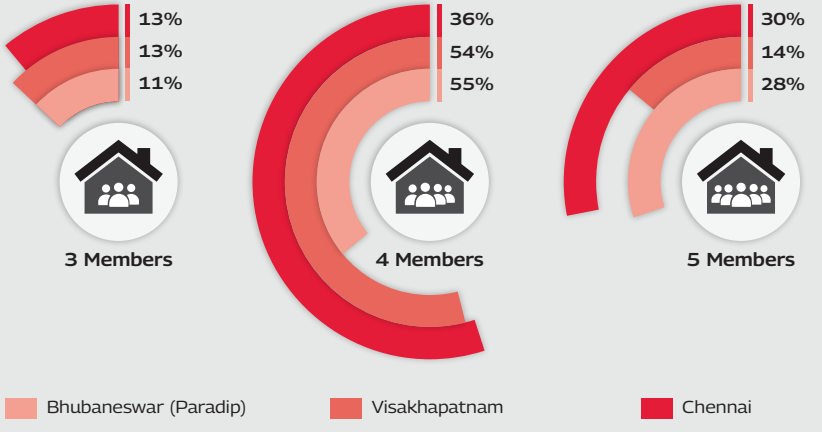
Socio Economic profiling

● Household size

Household size or the size of family is a critical indicator for assessing livelihood dependency. Big household size or family members exert greater pressure on available resources, thereby increasing the dependency ratio, i.e, the number of dependents (children, elderly, or non-working members) supported by working individuals. This can directly influence household income distribution, savings, and access to education, healthcare and employment opportunities.

Most respondents had four membered families followed by five members and six or more membered families. The following infographic show us the distribution of three, four, and five membered family in the three coastal towns.

Figure 17: Family Size Distribution Across Cities



● Earning members in the household

The number of earning members in a family plays a vital role in determining the household's economic stability and resilience. Families with multiple income earners are generally better positioned to meet daily expenses, invest in education, and manage financial emergencies. In contrast, households dependent on a single earning member are often more economically vulnerable, especially in the face of job loss, illness, or seasonal work fluctuations. Therefore, assessing the number and nature of earning members provides key insights into a family's livelihood capacity and informs the need for employment generation, skill development, and social support interventions. 70% of the respondents claimed to have just one earning member in their families. In Chennai and Bhubaneswar (Paradip), more than 90% respondents had one earning member.

● Fathers' education levels

Since most respondents belong to the age group of 18 to 24 years, there was a high likelihood of their fathers being the sole earning member of their families. 47% of the respondents' fathers had never had any formal education. Among these, 63% were fishermen and 25% were daily wage earners. Among the 19% respondents who reported that their father had completed school education till class 8th, 40% were wage earners, 37% were fishermen and 12% were in a private job. Of the 13% respondents who reported that their father had completed school education till class 10th, 42% were fishermen, 40% were daily wage earners and 14% were in a private job. Of the 5% of the respondents who reported that their father had completed school education till class 12th, 50% had a private job, 25% were into fishing and 17% were daily wage earners. This suggests a strong link between lower educational attainment among family heads and traditional or informal livelihood sectors such as fishing and daily wage earning.

Figure 18: Occupation Distribution by Father's Education

	Daily Wage	Fishing	Private Job	Service	Graduate
Never Been	25%	63%	8%	1%	3%
8th Pass	40%	37%	12%	4%	7%
10th Pass	40%	42%	14%	0%	4%
12th Pass	17%	25%	50%	4%	4%
Graduate	18%	9%	36%	27%	10%

● Family Income

Family income is one of the most crucial indicators of a household's economic well-being and access to opportunity. It determines a family's ability to meet basic needs such as food, housing, healthcare, and education. Higher family income generally correlates with improved living standards, better educational outcomes for children, and reduced vulnerability to financial shocks. Conversely, low family income often limits choices and access to essential services, reinforcing cycles of poverty.

62% of the respondent families cited monthly household income less than Rs. 15,000 p.m. while 25% had monthly household income between Rs. 16,000 to Rs 25,000 p.m. 13% had monthly income more than Rs 26,000 p.m.

13% had monthly income more than Rs 26,000 p.m. Most respondents from Bhubaneswar (Paradip) (27%) and Visakhapatnam (29%) reported to have a household monthly income less than Rs 15,000 while Chennai had only 7% respondents earning less than Rs 15,000 p.m. 87% of respondents from Chennai had monthly household income between Rs. 16,000 to Rs 25,000 while 6% had monthly income more than Rs 26,000.

On comparing the monthly family income across different livelihood activities carried out by heads of the family of respondents we find that irrespective of the education levels of the respondents' fathers, the average monthly income of the household is below Rs 15,000.

The monthly household income of 77% of daily wage earners is less than Rs 15,000 p.m. 20% of daily wage earners have a monthly household income of Rs 16,000 to Rs 25,000. 56% of fishing families earn less than Rs. 15,000 p.m. 35% of fishing families earn an income of Rs 16,000 to Rs 25,000 p.m. 68% of families with primary occupation in private sector earn less than Rs 15,000 p.m. while 58% of the families having primary occupation in service industry have a monthly household income of Rs. 15,000 and less.

Figure 13: <15,000 Income Distribution by Occupation

Occupation	Percentage
Daily Wage Earners	77%
Fishing	56%
Private Jobs	68%
Service Jobs	58%

Employment of the Respondents

Status and type of employment : About 33% of the total respondents reported to be employed while 67% had never been employed. Among that 67% respondents, 25% were from Visakhapatnam, 23% were from Bhubaneswar (Paradip) and 19% from Chennai (Figure 30 and 31 in Annexure B provides a visual representation of the status of employment of respondents as well location-wise status of employment).

Among the 33% respondents who were employed, 11% belonged to Visakhapatnam and 6% to Bhubaneswar (Paradip) and 17% to Chennai.

In the age group of 18-24 years, 53% of the respondents had never been employed while 23% had been employed before or were still under employment (A detailed visual representation is provided in Annexure B, figure 32).

Across different locations, respondents who are employed are mostly into monthly wage employment followed by daily wage employment (Figure 33 in Annexure B provides a detailed description).

Reasons for unemployment : Several reasons were cited by them for unemployment. 46% of the respondents stated not being able to find a job aligning to their educational qualifications as the main reason to not have been employed. 40% of respondents were still pursuing their education, while the remaining 14% had other unexplained reasons for the same (Figure 34 in Annexure B provides a detailed description).

In Bhubaneswar (Paradip), 40% of the respondents were still pursuing their education, while 60% had not found a job aligning with their qualifications as a reason for their unemployment. In Chennai, 67% of respondents were unemployed as they could not find jobs aligned to their educational qualifications, and the remaining 33% were pursuing their education. In Visakhapatnam, 56% of the respondents did not find a job aligning to their qualifications while 44% were still pursuing their education (Figure 35 in Annexure B provides a detailed visual representation).

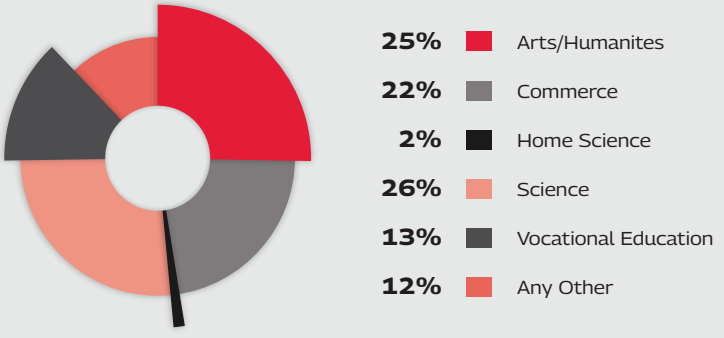
Of the 67% unemployed respondents from all the respondents, families of 23% of them were into daily wage earning, 32% were into fishing, 7% were into private jobs, 4% were into service (Figure 36 in Annexure B shows the following data in an infographic).

Among the respondents coming from a fishing background and had no job, 57% of the respondents cited not having been able to find a job aligned to their educational qualifications, while the remaining 43% were still pursuing their education (Figure 37 in Annexure B depicts the above mentioned data in a pie chart).

Level of Education of Respondents

Most respondents were graduates followed by 12th pass. 13% of the respondents have had vocational education from ITIs/or elsewhere. 26% of the respondents belonged to the Science stream, followed by 25% from Arts/Humanities and 22% from Commerce. 53% of the respondents had completed their education between 2020-25, followed by 39% who completed in between 2015-20. Highest share (70%) of 12th pass respondents had never been employed, which is the highest among all education levels (Figure 38 in Annexure B provides a detailed visual representation of respondents levels of education).

Figure 20: Stream of Education of Respondents



Education status across cities

◆ In Bhubaneswar (Paradip), 41% of the respondents were graduates, 36% were 12th pass. 47% of the respondents were females of which 46% were 12th pass and 38% were graduates. 74% of the females and 43% of the males surveyed were Arts/Humanities students. And 60% of the respondents had taken some skill training courses.

◆ In Chennai, 62% of the respondents were graduates, while 13% had vocational training in ITI's or elsewhere. Among the 31% of the female respondents, 52% were graduates. 27% of females were each equally distributed to Science and Arts/Humanities streams. Of the males surveyed, 29%, 27%, and 19% were from Commerce, Science, and Arts/Humanities backgrounds respectively. 7% of the respondents have taken some skill training courses.

◆ In Visakhapatnam, 42% were graduates, 21% were 12th pass. Among the 32% females, 66% were graduates. 36% of females were from Commerce background, while among male respondents were fairly distributed across Science (27%), ITIs (24%), Commerce (15%) and so on. 13% of the respondents had taken some skill training courses.

Most female respondents in all the locations were graduates or 12th pass which shows good education levels among females across all locations.

Education levels of fishing families

48% of the respondents from fishing families were graduates. 19% were 12th pass and 17% were vocationally trained from ITIs and 12% were 10th pass (Figure 39 in Annexure B shows the above mentioned data in detail through a visual representation).

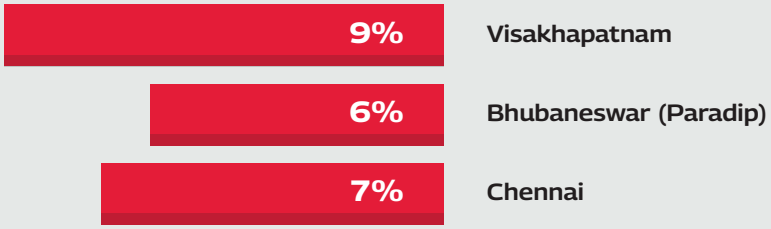
Status of skill training among respondents : 24% of the total respondents had taken up some or the other skill training course. Of these, 58% were graduates and 22% were 12th pass. Majority (42%) belong to Arts/Humanities, while rest 20% each belong to Science and Commerce stream.

76% of the total respondents had never taken any skill training course. Out of which, 37% had had a job and 63% never had a job. 80% of the respondents from fishing families never had any skill training.

Some of the skill training courses taken are: Air Conditioning Servicing, Banking, Basic Computing, Fitter, Basic Electronic Repairing, Fashion Designing, Tallying, Typewriter, Welding, Computer Language etc. Most popular course, however, is Post Graduate Diploma in Computer Applications or PGDCA, a one-year course offered in universities in India. 61% of the respondents who had skill training had enrolled in PGDCA and most were from Bhubaneswar (Paradip).

Status of on-the-job skill training : Only 7% of the total respondents agreed to have received some sort of on-the-job training which lasted from one to three months in most cases. Of this, 7% were in Chennai, 6% in Bhubaneswar (Paradip), and 9% of respondents were in Visakhapatnam.

Figure 21: Share of Respondents from each City who had recieved On The Job Skill Training



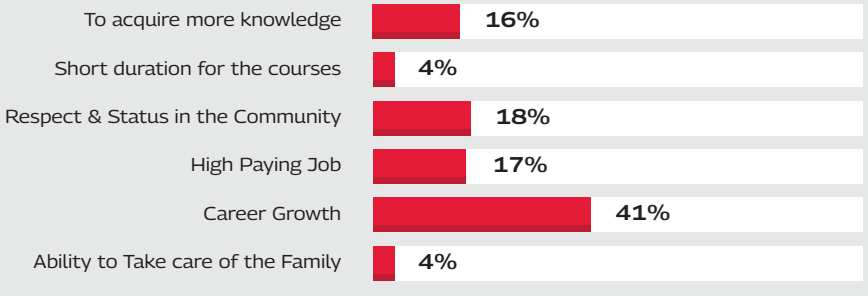
84% of the respondents who had a job did not have any on-the-job training or apprenticeship. 90% of respondents from daily wage earner families, 92% of respondents from fishing families and 96% of respondents from the private job holder families have never had any training.

Among total respondents in Bhubaneswar (Paradip), 30% of females were employed and 57% of them never received on-the-job training or apprenticeship. In Chennai, 51% of employed females did not receive on-the-job training, In Visakhapatnam 33% of females were employed and more than 40% of them did not receive such training.

Behavior Drivers and Motivation

Drivers of career choice : 60% of the respondents expressed interest in taking up further skill-based courses. 98% respondents in Bhubaneswar (Paradip), and 87% in Visakhapatnam expressed their interest for the same. In Chennai, however, this percentage is hardly 6%.

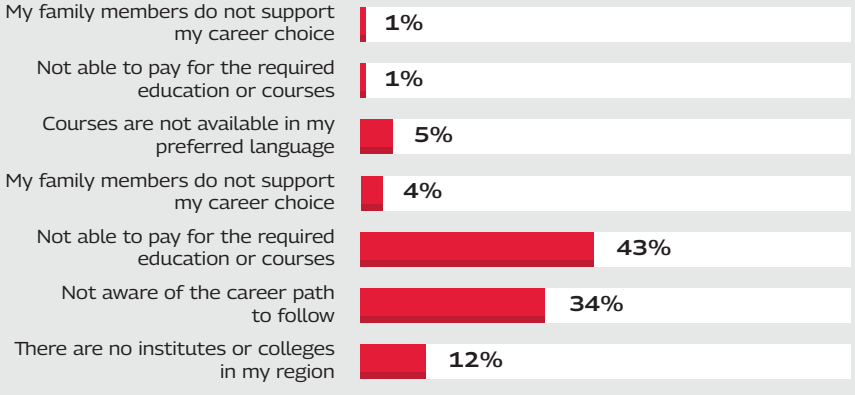
Figure 22: Behaviour Drivers to take up Skill Based Course



Respondents expressed their willingness to learn skill development courses because of several reasons. In Bhubaneswar (Paradip), career growth and knowledge enhancement are the major drivers among females and males, both. In Visakhapatnam, both males and females think that skill-based courses will help them achieve career growth, high remuneration, as well as respect and status in their community. In Chennai, however, it is majority male who are willing to take up skill-based courses to gain respect and status in the community and most belong to families with fishing as a primary source of livelihood.

Challenges in career choice : Respondents cited many challenges in pursuing their choice of career. Most of them cite the inability to pay for the required education or courses as the prime reason for not following a career growth path, followed by the non-awareness of the suitability of the career path to follow. Major reasons are given in the graph below. In Chennai, all the 44 respondents turned down the idea of taking up a skill-based course and 39% cited the inability to pay fees, 25% cited unawareness of the career path to follow after course completion, 23% cited lack of career institutes and colleges in the region, and 11% cited family unsupportive of career choice as the reason for the same.

Figure 23: Challenges faced currently in taking up Skill Based Course



Logistics as a Career Option

Career choices : If given a choice, most respondents would like to work in the logistics and shipping sector, followed by the government sector and private sector. The interest and willingness to work in different sectors varies across different cities. In Bhubaneswar (Paradip), 90% of respondents showed interest in working in the logistics and shipping sector, while in Chennai only 5% showed interest in the logistics and shipping sector. In Visakhapatnam, most (74%) respondents showed interest in private sector to work.

Figure 24: Respondents' Sectors of Choice

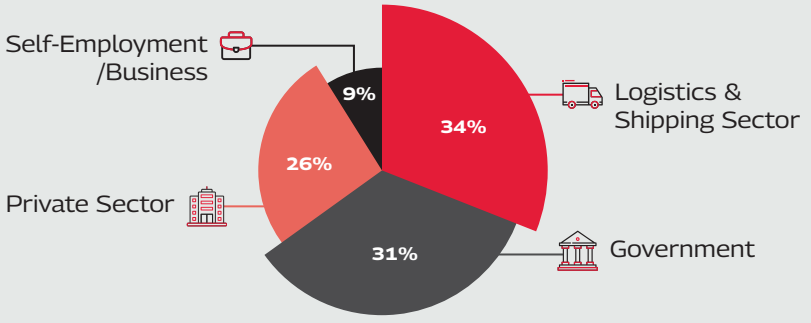


Figure 25: Sectors of Choice across different Cities

	Bhubaneswar (Paradip)	Chennai	Visakhapatnam
Government	5%	70%	10%
Logostics & Shipping Sector	89%	5%	15%
Private Sector	6%	1%	74%
Self Employment /Business	0%	24%	1%

Gender based interests : Female respondents showed interest in the logistics and shipping sector the most, followed by the government and private sector. Male counterparts showed interest in government sector the most, followed by logistics and shipping sector and private sector.

Figure 26: Career of Choice among Female

Employment profile of respondent's families interested in Logistics sector :
If we look at the background or primary occupation of the respondents' households willing to choose logistics and shipping sector as their career choice, we find that -

◆ In Bhubaneswar (Paradip), 96% of the respondents from daily wage-earning families, 94% from fishing families, 67% from private job families showed interest in the logistics and shipping sector. 45% female and 51% male respondents interviewed showed interest in the logistics and shipping sector. Out of the total 45% of the females willing to get into the logistics sector, 58% belong to daily wage-earning families, and 29% belong to fishing families. Among the 51% males willing to get into the logistics sector, 43% belong to daily wage-earning families and 37% belong to fishing families.

◆ In Chennai, most respondents showed interest in government sector jobs. 37% female and 62% male respondents interviewed showed an inclination towards the government sector. Only respondents from fishing families showed some interest in the logistics and shipping sector. All respondents willing to get into the logistics and shipping sector were male and belonged mostly to fishing families.

◆ In Visakhapatnam, 19% of the respondents were from daily wage-earning families, 12% were from fishing families, and 38% were from families into private jobs who were interested in the logistics and shipping sector. 37% female and 65% male respondents interviewed had an interest in the private sector. Out of the total 35% of females willing to enter the logistics and shipping sector, 50% belonged to fishing families and rest to families with daily wage earning and private jobs as primary source of livelihoods. Among males, 65% want to get into the logistics sector and among them 55% come from fishing families.

Sector specific job profile preference : Among the respondents who would want to work in the logistics and shipping industry, 60% would want to work as warehouse managers, 21% were interested in logistics and supply chain management, 10% showed interest in shipping, 7% in cargo management, and 2% in other job roles. Among both male and female respondents, the preferred area of interest within the logistics sector is warehouse management followed by supply chain management. 75% females and 49% males showed interest in warehouse management.

◆ In Bhubaneswar (Paradip), 70% of those interested in the sector would want to work in warehouse management, 25% in logistics and supply chain management. Within the logistics and shipping sector in Bhubaneswar (Paradip), out of the total 46% females showing interest in logistics, 58% showed interest in logistics and supply chain management, and 25% showed interest in warehouse management. Out of the 51% male respondents interested in the logistics sector, 70% showed interest in warehouse management and 25% showed interest in supply chain management.

◆ In Chennai, 60% respondents among the interested wanted to work in logistics and supply chain management, and 30% in shipping. In Chennai, none of the females showed interest in the logistics and shipping sector, while 60% male respondents showed interest in supply chain management.

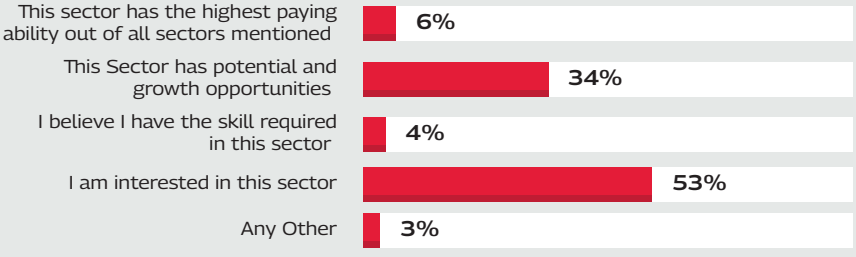
◆ In Visakhapatnam, among those interested in the logistics sector, 53% would want to work in warehouse management, 17% shipping, 15% in cargo management. Out of the total 32% of the total female respondents interested in the logistics and shipping industry, 84% showed interest in warehouse management with most looking at the growth opportunities this subsector possesses. Among 28% male respondents who are inclined towards the logistics sector, 36% showed inclination in warehouse management, 26% in shipping, 21% in cargo management, 15% in supply chain management, etc.

Figure 27: Preferred Job Profiles in Logistics Sector

	Bhubaneswar (Paradip)	Chennai	Visakhapatnam
Warehouse Management	70%	0%	53%
Logistics & Supply Chain Management	25%	60%	15%
Cargo Management	2%	10%	15%
Shipping	3%	30%	17%

Reasons of preference of a certain profile within Logistics : Most respondents who showed interest in logistics and warehousing were genuinely interested to explore the opportunities in the sector. There were others who found the sector full of potential for career growth. Of the 120 respondents showing an inclination towards the logistics and shipping sector, almost 95% showed willingness to take up a skill-based course in the same sector.

Figure 28: Reason of interest in Logistics Sector



The most preferred duration for a skill development course in logistics is one to three months, followed by three to six months. Most respondents preferred jobs in the logistics and shipping sector in locations where they would get trained or where the skill training academy would be. This is about 68% of the respondents. The remaining 22% would like to get a job in any location within their state. There are about 10% respondents who were willing to relocate to other parts of the country, if the job requires so.

Issues and Challenges

45% of the respondents cited difficulty to pay for the course/education in the past as the biggest challenge they faced in pursuing career growth. 29% cited faraway location of the institute as an issue in the past. 23% of respondents had problems understanding the curriculum and the rest 3% either did not like the method of training or did not like the trainers.

Figure 29: Challenges to pursue a Skill Development Coursein Logistics

	Bhubaneswar (Paradip)	Chennai	Visakhapatnam
Unable to understand the curriculum	11%	33%	20%
The location of the institute/college was very far	44%	19%	20%
Difficulty paying for the course	44%	45%	40%
Did not enjoy how the curriculum was taught	1%	3%	20%

Looking at the challenges in education in the past, across gender, we find that in Bhubaneswar (Paradip), most female and male respondents pointed to difficulty in payment for the course, and faraway location of institute as major challenges. In Chennai, most females said they had difficulty paying for the course and the location of the institute was an issue. Male respondents in Chennai pointed to their inability to understand the curriculum and difficulty paying for the course as major challenges.

Conclusion

From the study discussions, we come to conclude that educated youth in the coastal towns of Chennai, Visakhapatnam and Paradip are indeed non-aligned to their family occupations ,specifically, traditional marine fishing. One of the major reasons is that the earnings are quite low in these traditional occupations. We find that the monthly household incomes are quite low (i.e. less than Rs 15,000) among majority respondents in the three towns. Among the fishing population, 56% earned less than Rs. 15000 on a monthly basis.

We also find that despite having a good education (48% being graduates) record of the youth from fishing communities in these coastal towns, close to 57% of them are not being able to find opportunities aligned to their educational qualifications. This creates a classic demand supply gap which intensifies unemployment.

Demand for skill based courses is high among the youth because they see better income and career enhancement opportunities through these courses. Over a 50% respondents showed interest in skill based courses as per our study. The introduction of courses in logistics and shipping industry for these youth is a fairly feasible proposition as about 34% of them showed interest in such courses. 68% expressed their desire to get trained for the logistics and shipping industry and earn gainful employment closer to their training academies or native places.

Women respondents showing better interest in Logistics and Shipping than men is an indicator of readiness and willingness of women to contribute to the sector. Educated women from the non-fishing community seem less interested in logistics and shipping industry especially in Chennai. However, women from fishing community showed equal inclination as that of men from the same background to take up a career in Logistics and train for it. This indicates the need for inclusive efforts to train women participants especially from fishing community in Logistics and Shipping industry.

The accessibility and affordability of the courses in Logistics training seem to be a concern for most respondents. It is important that these challenges should be gauged and met with suitable interventions such as fee support, transportation and accommodation assistance.

Recommendations

Tackling the demand-supply gap

Charting a way of matching demand and supply of resources in the job market is important. After a thorough counselling, training and handholding, eligible candidates must be supported in the choices they make in the Logistics sector. Job markets in the vicinity of training institutes, types of job roles in demand, wages and retention benefits for the candidates must be well matched to their interest, educational background, willingness to relocate, willingness to travel, role expectations, salary expectation etc.

The expectations of students from the sector and its job opportunities before the training and after the training must be compared to note a difference in perspective. This would lay a foundation for career counselling for the students to choose the right roles for themselves during placements. As an addition, the vast scope of opportunities of the sector in both government and private sector must be provided to the students to find a place for themselves. For example, in Chennai, where most respondents marked government jobs as their preferred sector of employment, there is a need to elaborate on the jobs with government in logistics sector and how they are different from the job opportunities in private sector. We also need to assess the sector alignment with the education background of youth in each city as it will determine their interest. For example, 52% interviewed females and 69% interviewed males were graduates in Chennai and showed little or no interest in skill-based courses as a way to better career and growth. Among these graduate students, 76% of females have had a job before while only 25% of the graduate males have had a job before. This is why females shows less interest in skill-based courses especially in logistics sector as compared to males in Chennai.

Tackling Female Workforce and their challenges

Globally, women formed only 8% of the logistics workforce in 2010. This percentage increased to 20% in 2018. In India, this percentage is 15% which is much lower than the country's women workforce percentage which is 41%[44]. Logistics sector is often considered as a male run and dominated sector with the opportunities and roles limited to start a career and grow in it. It is a lost opportunity for logistics sector to not have enough women and their skills contribute to the overall profitability and efficiency of the sector. However, this are changing rapidly in logistics with the increased participation of women in the sector. A lot more women are willing to take up roles in warehousing, packaging, sorting, administration and human resources within the logistics industry. Employers, too, are looking to balance their gender employment ratio bringing in diversification and inclusivity into the employment narrative. A lot is required at the end of stakeholders to make women aware of these opportunities, train them in skills apt for roles, find opportunities and upskill them, if required. In order to make sure that more and more women are represented in logistics sector to earn a decent living for themselves and their families we need to focus on the following points:

■ Skill Development

Creating awareness among potential female employees and their families on the opportunities in the sector is the first and foremost step in this direction. Young girls and boys must become aware of the sector at large, income opportunities, roles and requirements and skill training. Skill training should be taken up for the interested young girls and women to equip them with necessary skills to thrive in the industry. The job market, too, should focus less on gender and more on skills and aptitude based recruitments. In order to make 'hard-logistics' a choice for women to take up, technology such as robotics should be made available. Skill based training in subsidised costs, scholarships and internship opportunities should be provided to women from fishing communities who are willing. Women specific skill development programmes could be designed to promote logistics as a career among female students. This would reduce the skill gap among men and women and automatically establish gender neutrality at the time of recruitment and growth.

■ Enabling mobility

As transport and warehousing are the two most important activities within Logistics, most women become ineligible due to their inability to ride. Only one percent of women in the country have commercial vehicle licenses (Dhawan, 2018). It is therefore important that women are trained on driving skills to increase the chance of their participation in various Logistics sector jobs. Employers must provide them with adequate support for mobility such use of automation and robotics for transportation.

[44] *Mahima Agarwal, 2023*

Women friendly workspaces

Unfortunately, safety for women across workplaces in the country is still not guaranteed. Work environment, work interactions and the demanding nature of work are especially to be blamed for. If we look in the transport industry, women are hard to spot as drivers, owing to challenges such as lack of proper rest stops and rest rooms, shared accommodations, lack of hygiene and physical security. This creates a psychological and mental block for women who are qualified and willing to take up jobs in the sector. it is important that safe transport facility to workstations, physical security arrangement, safe workplace environment, flexible timings, creches for baby care and other women friendly policies are put in place especially in the logistics sector.

Organisational commitments

Organisations and players in logistics sector must commit for an all-round women participation within the organisation. Such commitment would come in by developing an organisation wide culture to encourage women participation, providing equal opportunities, addressing gender pay gap, retaining female talent at all levels and roles, and creating career comeback opportunities for caregivers.

The sector is actually catching up on these policies with big players like Amazon operating two successful women only delivery centers in Trivandrum and Chennai and planning on adding more. Besides, Indian companies are also putting efforts to recruit women in logistics industry such as the Mahindra Group which has women working as forklift operators in its Chakhan plant near Pune, Maharashtra. Flipkart has as many as five sortation centers in Chennai, Surat, Indore, Coimbatore, and Vadodra completely run and led by women. Even Cargo has been set up as India's first 100% women driven logistics company with its operations spanning more than 10 states in the country. New age companies such as Flipkart, Ecom Express and Shadowfax are looking at enhancing women representation in their mid-mile and last-mile workforce. In fact, Ecom Express quoted 15-20% higher productivity with women delivery partners as compared to their gender counterparts. Roles in warehousing, sorting, shopfloor, retail sales, hub operations, grocery staffing has seen a surge in women hiring especially in tier-2 and tier-3 cities and towns (Dasgupta, 2017).

Tackling Transition challenge

From the data analysis most respondents belonged to the age group of 18-24 years and were unemployed. These respondents have never had a job either because they are still pursuing their education (graduation, mostly) or they have not found any job aligning to their educational qualifications. Most respondents from daily wage earning and fishing families showed interest in jobs in Logistics sector. In particular, warehouse management was the preferred job role within the sector.

As per our analysis, we find that most women from fishing communities have had some or the other form of employment. Females showed the most interest in Logistics and Shipping Sector, followed by the Government sector and Private sector. This is true for all cities except Chennai where none of the interviewed females showed interest in Logistics sector. This could be due to the fact that most females among the respondents from the city were better educated than their counterpart in other surveyed cities. There is a certain hesitation among educated female candidates for skill based courses especially in logistics which could create an opportunity for counselling and handholding about the sector and the promise it holds for them and their career.

Efforts should be made to make them understand the different avenues within Logistics. Suitable training strategies should be put in place considering the challenges and limitations of students such as their proximity to training institute, inability to pay full fee, lack of local language based instruction etc. needs to be looked at for effective training delivery and better opportunities. Course curriculum must be designed and delivered in local language in order to make it easier for the students to understand. City specific strategy for course content development and job placements should be planned for maximizing effectiveness of training and counselling. Students from fishing communities and more economically weak families should be given preferences in admission and in fee exemptions in the learning academies.

Annexure A

Effective Stakeholder Engagement

Government Interventions

Central and state governments come up with policies for the fisheries sector as a whole along with policies directed at the welfare of fishing community. There are central plan schemes with 100 percent central assistance while there are some centrally sponsored schemes where both state and central governments share expenses. State financed schemes are designed to suit the needs and requirements of the state. These schemes aim at augmenting production of fish, ensuring income and welfare of fisherfolk, promotion and adoption of climate adaptive and environment friendly actions and responses. In India, we have a dedicated Department of Fisheries under the Ministry of Fisheries, Animal Husbandry, and Dairying which sets the policy agenda for fisheries sector as a whole. There are dedicated institutions for fisheries development in the country and a lot of subsidy related schemes.

The budget outlay for fisheries sector has been increasing year on year with a total of Rs. 1879 crore outlaid for the sector of which Rs. 1169 crores were actually spent. A total budgetary allocation of Rs 2616 crores has been made for the Department of Fisheries (GoI) for the year 2024-25 against Rs. 1701 crore during 2023-24[45].

Neel Kranti Mission, 2016 had been approved at the total outlay of Rs. 3000 crores for implementation during five-year period (2015-16 to 2019-20)[46]. The components of the mission involve development of inland fisheries and aquaculture, development of marine fisheries, infrastructure and post-harvest operations, National Scheme for the Welfare of Fishermen, Monitoring, control and Surveillance of Fisheries, and set up of National Fisheries Development Board as an overarching body responsible for fisheries sector as a whole. Under the mission, subsidy was provided for activities and training of fish farmers on scientific fish culture practices.

Pradhan Mantri Matsya Sampada Yojana (PMMSY)- The scheme was announced in the Budget of 2019-20, with an aim to turn India a leader in fish production through appropriate policy, infrastructure and marketing support. It intends to promote aquaculture through easy credit facility and bring all the fisherfolk under social security blanket with accidental coverage extension. For the year, 2024-25, Rs. 2,352 crores have been allocated for the Pradhan Mantri Matsya Sampada Yojana (PMMSY) which is 50% higher than Rs 1500 crore allocated for the year 2023-24[47].

[45] *Ministry of Fisheries, Animal Husbandry & Dairying, 2024*
[46] *Department of Fisheries, 2018*
[47] *ibid*

SAMPADA Yojana- Scheme for Agro Marine Processing and Development of Agro Processing Clusters or SAMPADA was inaugurated in 2016 with an outlay of 6000 crores in order to have a Mega Food Park, Integrated Cold Chains and Preservation Infra for Marine Fisheries, Infrastructure for Agro Processing Clusters, Creation of backward and forward linkages, Food Safety and Quality Assurance Services, Human Resources and Institutions.

Fisheries and Aquaculture Infrastructure Fund-in order to fund infrastructure projects in fisheries a corpus amount of Rs 7522 crores was sanctioned.

Kisan Credit Card facility to fisheries sector was extended to fisheries sector in 2018-19 to meet working capital requirement of fish folk in their fishing related activities. An interest subvention under the loan under KCC was sanctioned by the Government just as in agriculture.

The state governments have also come up with both, novel and need based schemes for the marine fisherfolk.

Annexure B

Results and Discussions

Graphs & Infographics

Figure 30: Employment Status of the Respondents

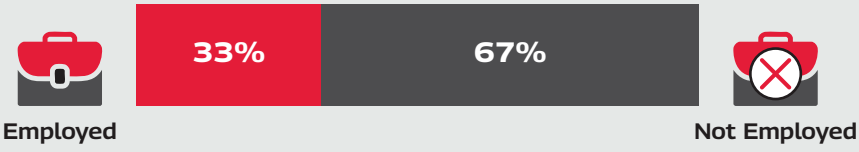


Figure 31: Status of Employment across Locations

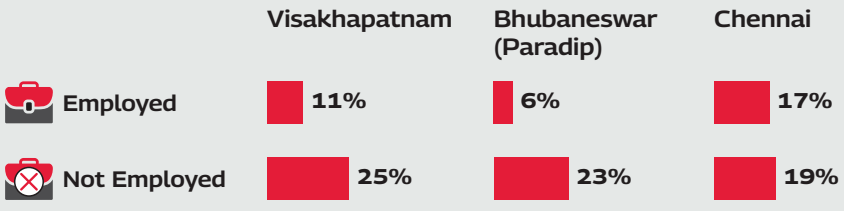


Figure 32: Employment by Age Group

	18-24 years	24-30 years	30-35 years	>35
Not Employed	53%	12%	2%	0%
Employed	23%	8%	1%	1%

Figure 33: Employment Type across Locations

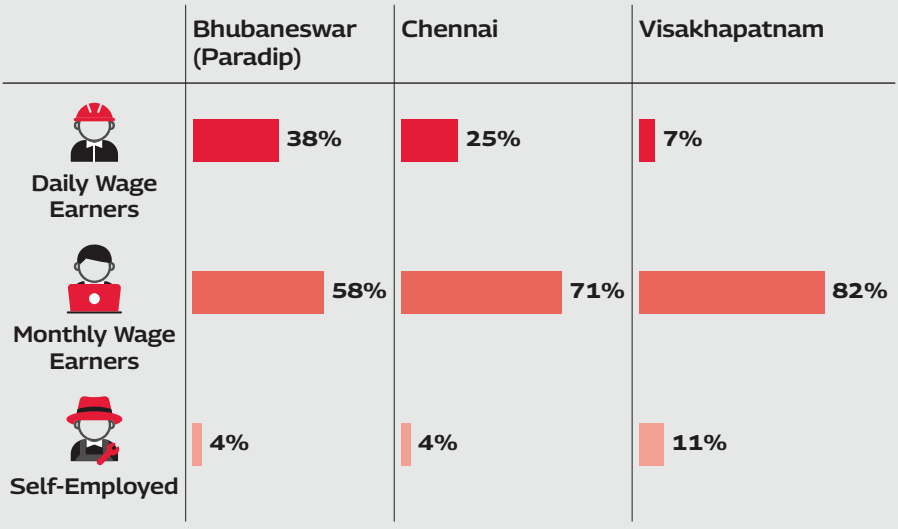


Figure 34: Reason for Unemployment among Unemployed

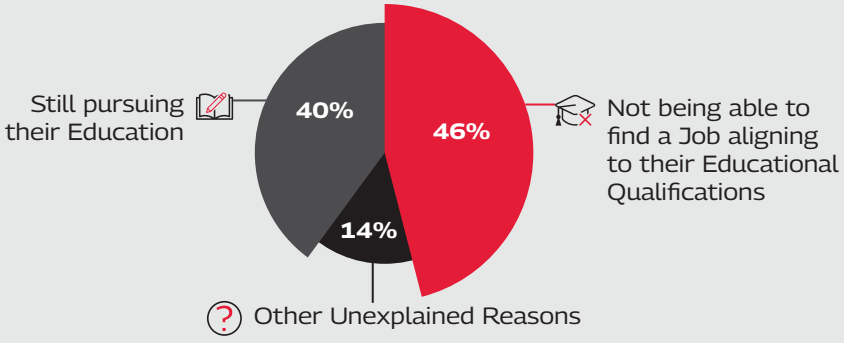


Figure 35: Reasons for Unemployment across Cities

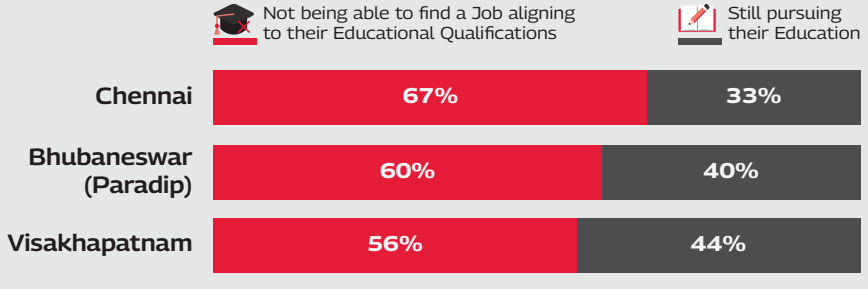


Figure 36: Distribution of Unemployed Respondents across Family Occupations

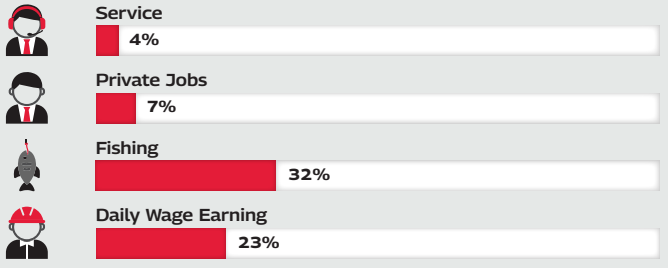


Figure 37: Reason for Unemployment among Respondents from Fishing Background

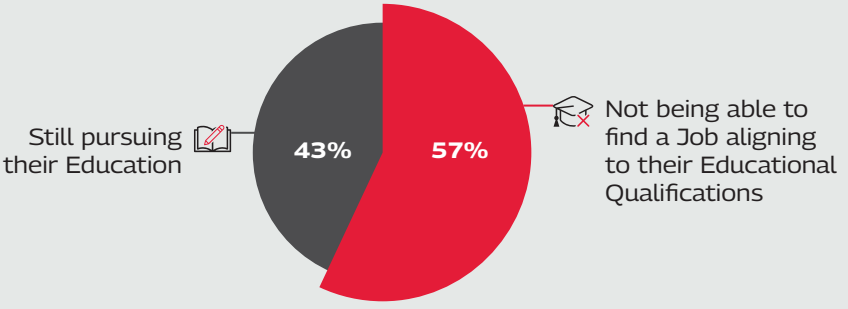
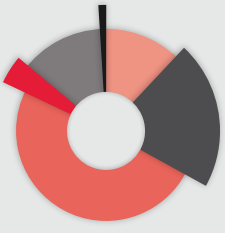
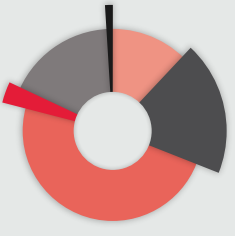


Figure 38: Highest level of education of respondents (Distribution of Education Level)



12%	10th pass
21%	12th pass
49%	Graduate
4%	Post Graduate
13%	Vocational education/ITI
1%	Any other

Figure 39: Education levels of Fishing Families



12%	10th pass
19%	12th pass
48%	Graduate
3%	Post Graduate
17%	Vocational education/ITI
1%	Any other

References

Ali, S & NS, Hanumat. (2023). Logistics Sector in Odisha. Tech Mahindra Foundation. https://stgborn.techmahindrafoundation.org/wp-content/uploads/2025/01/Logistics-Sectors-in-Odisha-Report-PDF-Web.pdf

Business Standard. (2023). Rising logistics demand expected to create 10 mn jobs in India by 2027. https://www.business-standard.com/economy/news/rising-logistics-demand-expected-to-create-10-mn-jobs-in-india-by-2027-123092101259_1.html

CMFRI-FSI-DoF. (2020). *Marine Fisheries Census 2016* - India. Central Marine Fisheries Research Institute, Indian Council of Agricultural Research, Ministry of Agriculture and Farmers Welfare; Fishery Survey of India and Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India. Kochi. Retrieved April 24, 2025, from https://eprints.cmfri.org.in/17490/2/Marine%20Fisheries%20Census_2016_India.pdf

NCRMP. (n.d). *Cyclones & their Impact in India*. Retrieved April 24, 2025, from https://ncrmp.gov.in/cyclones-their-impact-in-india/

FAO. (2020). *The state of world fisheries and aquaculture 2020*. FAO eBooks. Retrieved April 24, 2025, from https://doi.org/10.4060/ca9229en

FAO. (2024). *In brief to The state of world fisheries and aquaculture 2024*: Blue transformation in action. Rome. Retrieved April 24, 2025, from https://doi.org/10.4060/cd0690en

Fisheries Statistics Division, Department of Fisheries. (2022). *Handbook on fisheries statistics 2022*. Ministry of Fisheries, Animal Husbandry & Dairying. Retrieved April 24, 2025, from https://dof.gov.in/sites/default/files/2023-08/HandbookFisheriesStatistics19012023.pdf

Gatta, P. P. (2022). *The state of world fisheries and aquaculture 2022*. FAO eBooks. Retrieved April 24, 2025, from https://doi.org/10.4060/cc0461en

India Solid Waste Management. (2023, April 27). International Trade Administration | Trade.gov. https://www.trade.gov/market-intelligence/india-solid-waste-management

Kajal, K. (2020, April 8). Is the Lower Fish Catch Along India's West Coast the Work of Climate Change? https://science.thewire.in/environment/fish-catch-india-west-coast-climate-change/

Karnad, D., & Karanth, K. K. (2016, October 9). *Declining Indian fisheries: Perceptions of fisher folk from Maharashtra and Tamil Nadu*. Conservation India. Retrieved April 24, 2025, from https://www.conservationindia.org/articles/declining-indian-fisheries-perceptions-of-fisher-folk-from-maharashtra-and-tamil-nadu

Ministry of Commerce & Industry. (2023, June 14). *India's seafood exports touch an all-time high in FY 2022-23* [Press release]. Retrieved April 24, 2025, from https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1932317

Ministry of Environment, Forest and Climate Change. (2023, December 4). *Coastal erosion* [Press release]. Retrieved April 24, 2025, from https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1982315

Ministry of Fisheries, Animal Husbandry & Dairying. (2025, April 1). *Promote fishing practices* [Press release]. Retrieved April 24, 2025, from https://pib.gov.in/PressReleasePage.aspx?PRID=2117262#:~:text='Fisheries'%20is%20a%20state%20subject.%20While%20the,is%20the%20subject%20of%20the%20Union%20Government

Najmudeen, T. M. (2023). *Overview of marine fisheries of India. In International Workshop-cum-Training on Fisheries Management and Aquaculture*. Retrieved April 24, 2025, from https://imgs.mongabay.com/wp-content/uploads/sites/30/2025/01/16202709/AARDO_2023_T-M-Najmudeen.pdf

Nandi, J. (2021, July 17). *52% rise in frequency of cyclones in Arabian Sea over two decades: Study. Hindustan Times*. Retrieved April 24, 2025, from https://www.hindustantimes.com/india-news/52-rise-in-frequency-of-cyclones-in-arabian-sea-over-two-decades-study-101626550577184.html

Rao, G. S., Sathianandan, T., Kuriakose, S., Mini, K., Najmudeen, T., Jayasankar, J., & Mathew, W. T. (2016). *Demographic and socio-economic changes in the coastal fishing community of India*. Indian Journal of Fisheries, 63(4). Retrieved April 24, 2025, from https://doi.org/10.21077/ijf.2016.63.4.44288-01

Sarkar, U. K., Jena, J. K., Singh, S. P., Singh, A. K., & Rebello, S. C. (2012). *Introduction to fish and fisheries*. In Documenting Coastal Fish Biodiversity of India: Status, Issues and Challenges. Retrieved April 24, 2025, from https://nfdb.gov.in/PDF/Fish%20%26%20Fisheries%20of%20India/1.Fish%20and%20Fisheries%20of%20India.pdf

Sekar, S. (2024, September 16). Indus, Brahmaputra and Ganga among the top 10 plastic waste carrying rivers. Mongabay-India. https://india.mongabay.com/2018/01/indus-brahmaputra-and-ganga-among-the-top-10-plastic-waste-carrying-rivers/

Srimathi, G. (2024, December 25). *Tamil Nadu coast has 69 erosional zones, 20 sites in need of reformation*. The Hindu. Retrieved April 24, 2025, from https://www.thehindu.com/news/national/tamil-nadu/tamil-nadu-coast-has-69-erosional-zones-20-sites-in-need-of-reformation/article69023775.ece

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