

Gender Equity in Decarbonising Freight and Logistics Sectors in India

Brief Needs Assessment



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Abbreviations

AIMTC	All India Motor Transport Congress
AITWA	All India Transporters Welfare Association
ASSOCHAM	Associated Chambers of Commerce and Industry of India
CFS	Container Freight Stations
CITS	Craft Instructors Training Scheme
CPO	Charge Point Operators
CSO	Civil Society Organisations
CTS	Craftsmen Training Scheme
CII	Confederation of Indian Industry
e-FAST	Electric Freight Accelerator for Sustainable Transport
FIEO	Federation of Indian Export Organisations
GIPSWU	The Gig and Platform Service Workers Union
ICD	Inland Container Depots
ICE	Internal Combustion Engine
iGOT	Integrated Government Online Training
ILO	International Labour Organisation (ILO)
IPPTA	Indian Private Ports and Terminals Association
JIT	Just In Time
KPI	Key Performance Indicators
LCV	Light Commercial Vehicle
LSP	Logistic Service Providers
MoRTH	Ministry of Road Transport and Highways
NTFAP	National Trade Facilitation Action Plan
NUTP	National Urban Transportation Policy
OEM	Original Equipment Manufacturers
PBI	Press Bureau of Investigation
POSH	Prevention of Sexual Harassment
R & D	Research and Development
SFC	Smart Freight Centre
SWFS	Seafarers' Welfare Fund Society
TFA	Trade Facilitation Agreement
UCRD	United Nations Center for Regional Development
UNCTAD	United Nations Conference on Trade and Development
ZET	Zero Emission Trucking
3PL	Third-party logistics
4PL	Fourth-party logistics

1 Executive Summary

Research, initiatives and programs on the gendered aspects of passenger transport and mobility are available globally and in India. However, there is very little engagement with the freight sector from a gender perspective. The research and scheme on decarbonisation, electrification and a just transition are also primarily focused on the passenger travel segment. However, there is very little engagement with the large freight and logistics sector.

Women's participation in the workforce in India is much lower than the global average. At the same time, when addressing gender inclusion challenges, it is essential to classify initiatives as either gender-responsive or gender-transformative. This distinction helps establish clear objectives for policies, programs, and initiatives on needs and opportunities for women in decarbonising freight.

This study touches on three aspects: logistics and freight, decarbonisation of freight, and women's representation in the sector. It analyses the needs and challenges of women working in the sector and job opportunities for women to engage in decarbonising freight. The study is primarily based on secondary research. The freight sector is dominated by road freight, and hence, this study primarily focuses on road freight.

The report highlights key challenges women and other stakeholders currently engaged in the sector face. Current gaps in policies, provisions and training requirements for making the sector gender-equitable would be identified for including necessary programmatic interventions. It would also include a list of key stakeholders covering industries and organisations in the freight and logistics sector, Civil Society Organisations, and government stakeholders that must be engaged to enhance women's participation in the freight and logistics sector.

The logistics sector has been a major contributor to India's GDP. The logistics sector handles 4.6 billion tonnes of goods every year, amounting to a total annual cost of INR 9.5 lakh crore. These goods represent a variety of domestic industries and products: 22 per cent are agricultural goods, 39 per cent are mining products, and 39 per cent are manufacturing-related commodities.(NITI Aayog et al., 2021).

Logistics is a broader term that includes managing the entire supply chain, while freight deals only with transporting goods. We can broadly divide it into conventional and modern urban freight. While freight appears to be a recent subject, the government has been active in mail deliveries since 1774 (Pre-independence era). This is one of the oldest parcel services and falls under the last mile or urban freight. The freight sector is dominated by freight by roads with 78 per cent mode share. Railways carry barely 17.5 per cent of freight movement. This share has been constantly decreasing with the expansion of roadways. (Gota, S. and, 2021). Freight by trucks dominates the entire freight sector in India. For instance, the number of trucks is increasing rapidly, with 8.58 CAGR in last decade. With 13,766,000 trucks in 2019 (MoRTH, 2021).

The development of new roadways and highways is a primary reason behind the rapid growth of road-based freight. While trucks contribute mainly to regional freight, other vehicles, such as Light Commercial Vehicles (LCVs) and two-wheelers, dominate urban freight.

The last mile of urban freight has become integral to urban mobility in Indian cities. With the rapid growth of the technology-driven gig economy, app-based platforms for food and goods delivery are proliferating in the last-mile segment. They are also known as 'Just-In-Time (JIT)' This has also created multiple jobs under categories such as independent contractors, freelancers, and self-employed. Urban freight is a complex topic with numerous implications for urban mobility. The delivery personnel are assigned a specific task only when there is demand. According to (Shipsy, 2024), this segment's contribution to the overall gig economy is significant, with a 10% market penetration.

Overall, 22 million people are involved in the logistics sector (NITI Aayog et al., 2021). (Patwardhan, 2023) highlights that globally, women comprise 8 per cent of the workforce in the transport industry and 15 per cent in India. However, there are barely 27 women per 1000 compared to 117 males per 1000 in the transport industry (Patwardhan, 2023). In the gig economy, the primary transport and delivery platforms engage approximately 3.3 million workers, which includes the ride hailing and delivery market, out of this, women comprise less than 1% of app-based ride-hailing and delivery drivers (IFC, 2018).

For context, this number surpasses the 1.3 million employees of the Indian Railways, the country's largest employer (Safetipin & GIZ, 2024). The e-Shram database highlights that the total 'registered workforce' in the gig economy was 0.72 million in 2022.

According to studies by Team Lease Services, the total number of women employed in the delivery industry across various roles was 67,900 in 2019, up from 40,000 in the previous year (Kar, 2019) . Companies like Amazon, Zomato, and Swiggy are moving towards hiring women delivery partners and establishing facilities for them. However, lack of data is a major issue. Hence, the government should make it mandatory for public and private companies to collect and report data on number of women employees to the Labour enforcement officer. This requirement applies to all companies exceeding a specified employee number. In addition, the companies should collect and report qualitative data in the form of perception studies that can help change the mindset and bring in change in perception.

The rise of the gig economy, and JIT has created multiple jobs. Apart from the challenges faced by working women, the women working in JIT face additional challenges such as long and unpredictable working hours, safety challenges of working in unknown areas, gender discrimination in remuneration, absence of health benefits, and income irregularity. The lack of gender-disaggregated data on platform workers makes it difficult to conduct statistical analysis.

Apart from this, the Social Security Code and other policies or advisory documents do not address the needs of platform workers. The lack of collective organisation among them further hinders their ability to present issues in a unified manner for resolution.

While women working in JIT have very specific issues, women working in logistics, supply chain or freight have more conventional concerns such as the poor representation of women at the senior management level, the dominance of the male-dominated truck industry, the lack of formal training, and the lack of working capital for women traders in logistics. Women delivery partners may get equal pay, but they are excluded for evening and night shifts because of safety concerns, limiting their earning potential. They are contract staff and not full-time employees and hence do not have access to benefits such as maternity leave.

The key informant interviews highlighted challenges including the hesitancy of employers to hire women, as they doubt their efficiency, the need to improve infrastructure, to address women's needs, and ensure their safety at the workplace and while they commute. Overall, there is a need for a fundamental shift in mindset, and to integrate social responsibility with business strategy.

Governments can offer incentives to businesses that actively recruit women and ensure a safe, inclusive work environment to encourage broader participation of women in the workforce. The good practices in the sector highlight the efforts by companies to increase the percentage of women in the sector. A leading electric Light Commercial Vehicle (LCV) manufacturer has a complete assembly line managed by women. The workspaces have also been redesigned to meet the needs of women. Some international examples from Germany, Australia, and Turkey highlight measures to provide skill development training and incentives to interns working in the logistics or rail freight industry.

Apart from the day-to-day challenges of women in freight, skill development is a significant challenge on which industries need to work actively. The skills gaps and multiple challenges are leading to severe attrition from the logistics sector. While a reasonable portion of the jobs, such as those in warehouses and middle or senior management, are amenable to women, the actual participation of women is very low due to skill gaps and poor working conditions (KPMG, 2007). (Jhawar et al., 2014)'s study on the impact of skilled labour on the Logistics Performance Index (LPI) demonstrates the relationship between skilled labour and profit.

The study highlights that investments in appropriate training programs and a better workplace can improve the retention rate. A skilled workforce positively affects corporate reputation building, recruitment, and retention of employees. In addition, the skilled workforce has a positive relationship with a reduction in cost, reduction in time, and improvement in reliability, flexibility, and safety of a logistics system. Overall, the skilled workforce has a positive impact on LPI. A shortage of skilled professionals trained in modern logistics practices and technologies is another challenge for the industry. At the same time, decarbonisation has generated new job opportunities for women in technology (Sayeda, 2025). The low percentage of girls in STEM-related courses can adversely impact their participation.

Regarding policies, programs and schemes on women's empowerment and decarbonisation, the biggest challenge is that the representation of women in the sector is not well acknowledged in policies. While convergence of policies and programs can boost women's workforce participation, the government must facilitate this process. The Social Security code and fund have the potential to go deeper into women employees, recommend suggestions, and allocate separate funds for their development.

Decarbonisation schemes, such as Faster Adoption and Manufacturing of Electric Vehicles in India (FAME II) has a component that provides subsidies for buying electric trucks against scrapping old internal combustion engine (ICE) trucks. The details of the subsidy are yet to be published (Gazette of India, 2024). However, there is scope for additional subsidies for women truck drivers to increase their participation.

Forums by NITI Aayog, like e-FAST, should facilitate and highlight women's involvement. In addition, the transport industry should address women's specific requirements. For instance, truck designs to address the height of driver's seat and other anthropometric design specifications. In addition, electric and auto transmission vehicles can make driving and handling the vehicle easy for women. The NGOs can help to provide training with respect to non-conventional jobs. Policy makers should analyse women's daily, monthly, and yearly barriers and challenges working to systematically remove barriers to participation. For instance, there are multiple barriers but some of the examples are- daily barriers with respect to daily commute, monthly barriers as menstruation challengers etc. the companies should facilitate financial assistance to invest in electric two-wheelers for deliveries.

The public infrastructure should address women's needs. Making streets safer is crucial—well-lit, active streets with smaller blocks can help women navigate more easily. For women in freight, access to public toilets is a major issue. These toilets should be more than just toilets. They should offer spaces and facilities to rest and for nursing. The government should lead grassroots activities to enhance women's participation in the sector, such as developing mentorship and sponsorship programs, engaging women in senior leadership, designing demand-driven training, and establishing the Institute for Skilling and Capacity Building in Logistics.

The role of industry owners is also important. While the last mile for short-distance deliveries is attracting women to work as delivery partners, the companies need to mitigate the challenges they face. Providing access to low carbon mode and training for JIT women partners and enhancing their access to technology can yield great results. Initiatives by companies to respect the needs of women employees and efforts to tap the potential of women leaders and prioritise women in hiring can significantly impact the percentage of women in the industry. In addition, adopting appropriate retention strategies by training, counselling, designing workspaces according to the needs of women, such as toilets, resting areas, creche for employees' children, inclusive work environment, and improving the comfort of women employees can help immensely.

In short, the rise of JIT and decarbonisation of freight offer multiple opportunities for women. However, it is the collective responsibility of the government and the private sector- logistics companies and civil society organisations- to ensure that women are well represented at all levels in the decarbonising logistics and freight industry.

2 Introduction

2.1 Background and Context

The Paris Agreement aims to limit global temperature rise to 1.5 degrees above pre-industrial levels by reducing greenhouse gas emissions. Transport accounts for 15% of these emissions, a figure expected to increase rapidly unless swiftly curtailed by appropriate mitigatory measures. By 2050, global freight emissions are projected to account for 61% of all transport emissions (ITF 2023), emphasising the urgency of decarbonising freight and mitigating its environmental impact. In India, such a shift is essential, as without any interventions, goods movement is anticipated to be 451 per cent of current CO₂ emissions from 220 million tonnes in 2020 to 1,214 million tonnes by 2050 (NITI Aayog, RMI India 2021).

Freight transport in India includes road (primarily trucks), rail, coastal and inland waterways, pipelines and airways. Overall, it is dominated by trucks. India has outlined ambitious policies in its Long-term Strategy for Low Carbon Development to address these issues—India’s goal of net zero by 2070 hinges on a shift to clean vehicles. Concerning this study, promoting electric freight vehicles, particularly in last-mile urban deliveries, is a key to achieving the goal.

Another challenge in the sector is the low representation of women. Roads, particularly by trucks, dominate the freight in India. The truck industry is highly male dominated. In addition, newly emerged gig economy jobs in last mile freight by platform industry (Just in Time) provide employment. However, women are underrepresented in this sector as well. Hence, logistics and last-mile freight challenges need to be studied. Considering the scope for decarbonisation of trucks and urban freight, we are analysing the opportunities for women in this sector.

This study aims to identify key factors for the gender imbalance in terms of women’s participation in logistics and freight, explore opportunities for women in India’s efforts towards decarbonising freight and identifying interventions.

2.2 Need for the Study

Globally and in India, research and initiatives and programs on the gendered aspects of passenger transport and mobility are available. However, there is very little engagement with the freight sector from a gender perspective. The research and scheme on decarbonisation, electrification, and a just transition are largely focused on the passenger travel segment. There is very little engagement with the larger freight and logistics sector. Women's participation in the workforce in India is much lower than the global average.

At the same time, when addressing gender inclusion challenges, it is essential to classify initiatives as either gender-responsive or gender-transformative. This distinction helps establish clear objectives for policies, programs, and initiatives on needs and opportunities for women in decarbonising freight.

2.3 Methodology

This study is primarily based on secondary research. Government documents, reports, and data from authorised websites are significant relevant information sources. In addition, the analysis also includes excerpts from relevant blogs. Key stakeholders will be interviewed to understand the existing trends, challenges, and opportunities for women in decarbonising freight.

2.3.1 Key Activities

The following will be the key activities of this assessment:

- I. Analysing key policies on mobility, decarbonisation and women's empowerment stakeholder mapping
- II. Identify key challenges that need to be addressed to make the sector more women-friendly—skilling and training, access to opportunities, safety and mobility, social norms, technology barriers, etc.
- III. Identifying training needs for increasing women's participation in the sector.

Scope and Limitations

- I. The report will primarily focus on secondary research. However, insights from a few stakeholders will be included.
- II. The statistical and analytical data in the sector of women in logistics and freight are limited, and hence, the analysis is based on secondary sources.
- III. The authors acknowledge that child labour in logistics presents multiple challenges; however, due to the complexity and vast nature of the issue, the study does not cover it.

3 Logistics and Freight Sector in India

3.1 Sector Overview: Logistics

The logistics sector has been a major contributor to India’s GDP. The Economic Survey of India conducted in 2021 revealed that logistics accounts for approximately 13-14 per cent of the country’s GDP (RSM, 2022). India is also one of the leading countries in the logistics performance index (Figure 1). Overall, 22 million people are involved in this sector. The sector handles 4.6 billion tonnes of goods every year, amounting to a total annual cost of INR 9.5 lakh crore. These goods represent a variety of domestic industries and products: 22 per cent are agricultural goods, 39 per cent are mining products, and 39 per cent are manufacturing-related commodities.(NITI Aayog et al., 2021). While agricultural and mining deal majorly with regional freight, a substantial share of manufacturing-related commodities strongly connects with urban freight.

Concerning women in the sector, some major challenges are the perception that the logistics sector is currently still a man’s world, lack of women role models (Transport Logistics, 2024). In addition, supply chain roles often involve demanding schedules, long working hours and extensive travel, which can create challenges for individuals seeking work-life balance. These challenges disproportionately affect women (Yang et al., 2024). Subsequent sections discuss these challenges in detail.

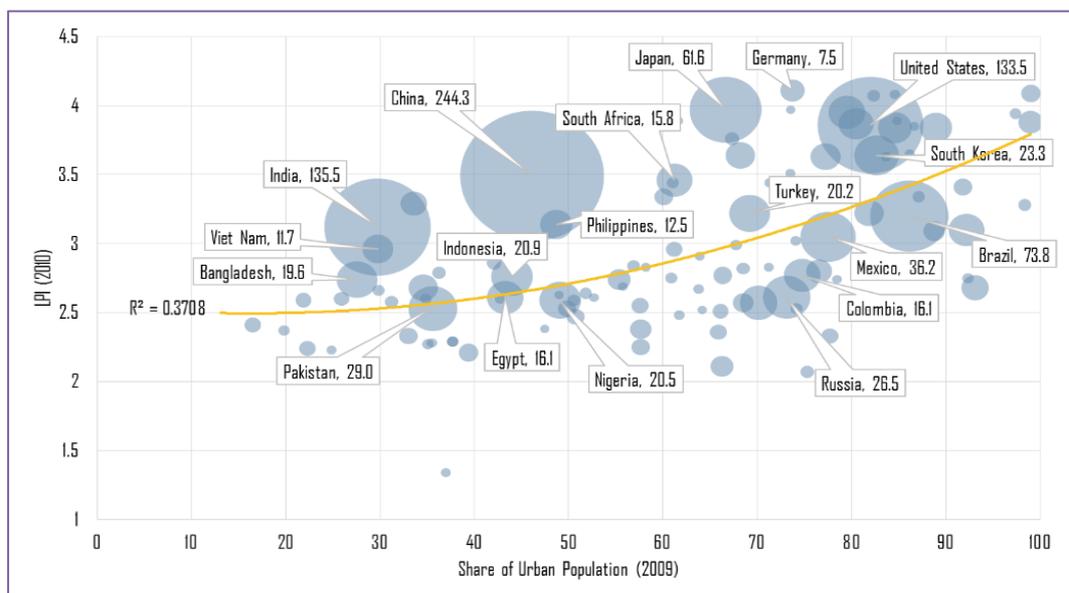


Figure 1: National Urban Populations and the Logistics Performance Index¹

¹ Image is created by (Dablanc & Rodrigue, 2017) using World Bank, Logistics Performance Index. Urban population data

3.2 Sector Overview: Freight

Logistics is a broader term that includes managing the entire supply chain, while freight deals only with transporting goods. Broadly, freight can be categorised based on the distance, product type and mode. Under the product type, the major categories are dry bulk, wet bulk, refrigerated, containerised, and break bulk (NITI Aayog et al., 2021). Figure 2 demonstrates the relationship between freight categorisation based on mode and distance. This study mainly focuses on road-based freight and analyses the needs and opportunities for women in the sector.

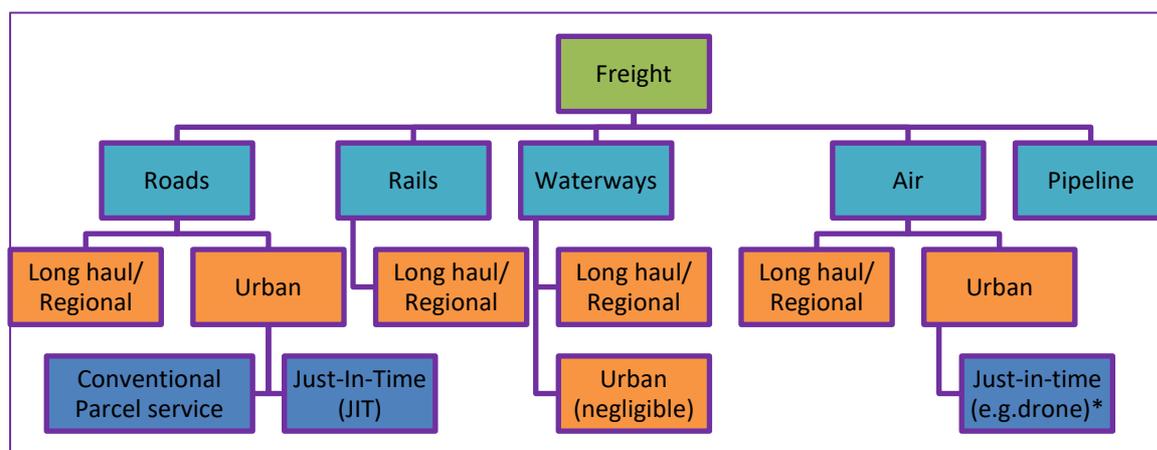


Figure 2: Categorisation of Freight Movement in India (*evolving)²

3.3 Child Labour in Logistics

The Child and Adolescent Labour (Prohibition & Regulation) Act covers complete prohibition on employment or work of children below 14 years of age in all occupations and processes. A study (India Moderate Advancement, 2024) provides an overview of children's work by sector and activity and highlights that child labour and forced Child labour is a challenge in almost all industries. The Centre for Child Rights and Business mentions that child labour within India's supply chains is a serious issue, particularly in high-risk sectors like cotton, sugarcane, peppermint, apparel, leather, and toys. According to Team Insight (2022); due to the increasing complexity of global supply chains, this hidden harm of child labour has become more difficult to identify with the involvement of middlemen, traders and corporations.

from United Nations, World Urbanization Prospects: The 2007 Revision Population Database.

² Graphics created based on (NITI Aayog et al., 2021)

However, it is a complex issue that makes it difficult to identify whether child labour is a part of the supply chain or not. For instance, many communities view children as contributors to household income.

This means that even when children work, they are thought to be ‘helping’ the family. “One child might graze the family’s cow, but the milk goes into the supply chain. While on the surface it does not look like child labour as the child is helping with household chores, at a larger scale it is a part of the supply chain,” says Vasudeva Sharma of Child Rights Trust, Bengaluru (Team Insight, 2022). This study acknowledges that it is a serious issue, but it does not go deeper into it.

(Dube, 2013) argues that children are also noticed working in labelling and packing jobs in factories and beedi rolling in homes, for instance, but their employment was not shown in the records, nor did the employers of child workers admit them as workers on the pretext that they were helping their parents. (Venkateswarlu, 2007) highlights that industries like the cotton supply chain harm children's literacy and health. About 90% of the children working in cottonseed fields are school dropouts or have never attended school. They face health issues like severe headaches, nausea, weakness, convulsions, and respiratory depression.

The government of India launched the Khoya-Paya portal in 2017 for registering complaints related to child labour. As per the portal, 198351 children have been identified since the launch of Pencil. (Ministry of Labour and Employment, 2024) The portal highlights that, out of the total number of children rescued since 2017, the percentage of children working in various types of industries (non-domestic) is quite high.

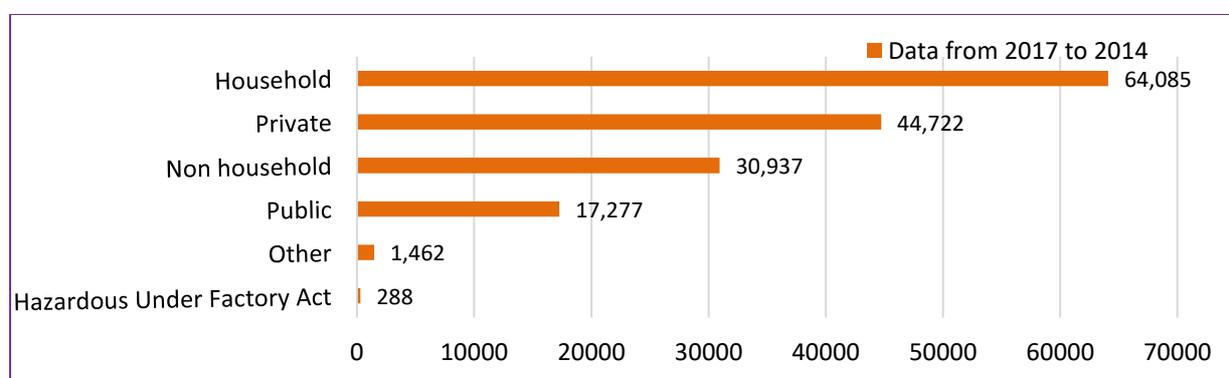


Figure 3: Data on Children Rescued /Found -Work Sector Wise Break Up³

³ Ministry of Labour and Employment, 2024

3.4 Freight Modes and Characteristics

3.4.1 Railways, Ports and Aviation

The freight sector is dominated by freight by roads with 78 per cent mode share. Railways carry barely 17.5 per cent of freight movement. This share has been constantly decreasing with the expansion of roadways (Gota, S. and, 2021). Airways and waterways carry the rest. Railways can carry more than six times the traffic that roads can carry using the same quantity of fuel. They are cost-effective and result in lower energy consumption and CO2 emissions. However, the changing needs of industries and increasing reliance on roads have resulted in a decreasing trend of freight by rail. (NITI Aayog, 2018)

3.4.2 Existing Scenario of Road Freight in India

India's freight share by roads is higher than that of other major economies, such as the United States and China (45–50 per cent). For the last three decades, there has been tremendous growth in freight by road. It has grown from 8% in 1990 to 78% in 2016. (Gota, S. and, 2021). Not just within freight by roads but overall, trucks dominate the entire freight sector compared to railways, waterways, pipelines, and airways. For instance, the number of trucks is increasing rapidly, with 8.58 CAGR in a decade. As per the 2019 data, there were 13,766,000 trucks (MoRTH, 2021).

The development of new roadways and highways is a major reason behind the rapid growth of road-based freight. As shown in Figure 4, the increase in the length of national highways is more than 300 per cent, whereas it is barely 5 per cent in the development of rail tracks. Freight by rail lacks investment and faces challenges like capacity saturation, cross-subsidising passenger traffic by freight, unreliable delivery times, and first and last-mile connectivity (D Gupta & Dhar, 2022). This study will primarily focus on the high share of road freight.

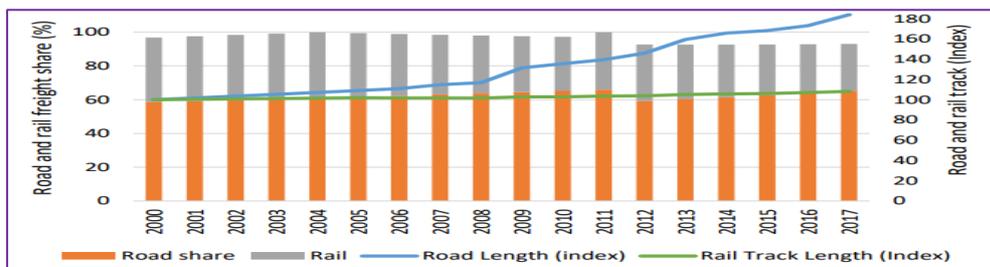


Figure 4: Percentage share of road and rail in total freight traffic from 2000 onwards⁴

⁴ NTDP, 2014; MoRTH, 2021; Ministry of Railways, 2020a) (D. Gupta & Dhar, 2022)

3.5 Urban and Regional Freight

3.5.1 Regional and Long-Haul Freight

As mentioned in the earlier section, regional freight is dominated by trucks. However, they lack operational efficiencies. (P. K. Sahu et al., 2022) highlights that the cost inefficiencies in trucking are driven by avoidable running costs created by empty backhaul of trucks, usage of trucks with reduced fuel economy, and insufficient feet size and mix of logistics providers, which lead to inefficient utilisation of trucks for forwarding shipments.

Another challenge associated with freight by trucks is road safety and congestion. Often, the truck sizes are smaller, often, they are overloaded beyond their capacity.⁵ (D. Gupta & Dhar, 2022) argues that high fragmentation and lack of regulations result in the overloading of trucks.

Other major reasons behind frequent road accidents are the premature ageing of vehicles and the deterioration of the roads. According to a study by Mohan et al. (2020), 72 percent of trucks are involved in road crashes on six-lane highways. While freight by road is substantial, there are many road safety issues.

- **Trends in Urban Freight and Last-Mile Delivery**

Urban freight is a complex topic with multiple implications for urban mobility. We broadly divide it into conventional and modern urban freight. Through traffic, such as trucks circulating in a city to another destination without serving any business or household in the city, it becomes a part of urban mobility. Urban freight is defined as transporting goods by or for commercial entities (as opposed to households) in urban areas.

This definition includes all goods movements generated by the economic needs of local businesses: warehousing and activities such as deliveries and pick-up of supplies, materials, parts, consumables, mail, and trash (Dablanc & Rodrigue, 2017). It also includes home deliveries to households, generally done using a commercial transaction.

⁵ <https://economictimes.indiatimes.com/news/economy/policy/government-raises-load-capacity-for-heavy-vehicles-by-20-25/articleshow/65017330.cms?from=mdr>

- **Conventional Parcel Services**

While freight appears to be a recent subject, the government has been active in mail deliveries since 1774 (Pre-independence era). The first General Post Office was established in Kolkata in 1774. Later, Speed Post service was started in August 1986 to provide time-bound and express delivery. This is one of the oldest parcel services and falls under the last mile or urban freight. Later, many private companies established their parcel delivery services.

However, the government-led initiative is still an important parcel service in rural and urban India. For instance, the department delivered 480 crore deliveries in various parts of India.⁶ (Department of Posts, Ministry of Communications, 2022). Besides this, there are services like electronic money orders. Overall, this conventional parcel delivery sector, which does not fall under ‘just-in-time’ services, is also one of the important types of urban freight. (Department of Posts, Ministry of communications, 2022).

3.5.2 Gig Economy and Freight

The technology-driven gig economy is booming in India. Rapid emergence and expansion of various “on-demand” digital platforms and other e-commerce and online retailing platforms are contributing to the rapid growth of the gig economy. This has also created multiple jobs under categories such as independent contractors, freelancers, and self-employed. The (Government of India, 2019b) defines a gig worker as “a person who performs work or participates in a work arrangement and earns from such activities outside of a traditional employer-employee relationship”. Data from 2022 shows that the total registered workforce in the gig economy was 0.72 million.

- **Just-In-Time (JIT) Services**

There are two main types of platform work in the gig economy, “crowd-work,” for which tasks are performed online and remotely, and “work-on-demand via app,” location-based platforms, for which jobs are executed locally. (De Stefano, 2015). Last-mile freight that falls under “work on demand” using technology. It is also called Just-In-Time (JIT) services. The delivery personnel are assigned a specific task only when there is demand. For this report, we are using JIT as terminology to indicate workers working in the last mile freight segment using the ‘work on demand’ platform category of the gig economy.

⁶ The number also includes deliveries in rural India

According to (Shipsy, 2024), this segment's contribution to the overall gig economy is significant, with a 10 per cent market penetration. There are several benefits of JIT. (Bhusiri et al., 2014) argues that the adoption of JIT in urban freight transport has resulted in punctual, reliable, and flexible services. It can also contribute to cost reduction and service maximisation. However, the personnel working in it face numerous challenges. The next section describes the challenges faced by women in JIT.

3.6 Challenges of Women Working in JIT

All Indian cities face problems due to inefficient goods handling methods. Urban freight has been neglected even in the comprehensive mobility plans of many cities. Freight by roads is a major factor contributing to carbon emissions. Urban freight is a factor that causes traffic congestion and impacts air quality adversely. In addition, the JIT services demand speed on urban roads and are creating safety challenges for all road users. (Gota, S. and, 2021). While there are multiple challenges associated with JIT and urban mobility, the challenges of women working in this sector are worrisome.

- **Lack of Gender-Disaggregated Data in the Gig Economy and in JIT Services**

The unavailability of gender-disaggregated data in the gig economy is a major challenge to analysing the share of women, analysing their challenges and recommending remedies. As per the studies by Team Lease Services, the total number of women employed in the delivery industry across various roles was 67,900 in 2019, which grew from 40,000 in the previous year. Out of the total jobs in the gig economy, around 60 per cent are in food tech, 30 per cent in e-commerce and courier services and 10 per cent in hyperlocal delivery (Teamlease, 2024) .

However, compared to the total number of gig workers in 2019, per cent of women gig workers is marginal. Amazon, one of the largest companies in the sector, hired its first 20 female delivery partners in 2015. Later, the company added 800 women in 2018. They have a dedicated delivery station in Chennai run solely by women. From this centre, the packages are delivered by women partners on two-wheelers, covering a 2-3 km radius from the station. (Kar, 2019). However, in the industry, there are a handful examples like this.

- **Long and Unpredictable Working Hours**

The International Labour Organisation (ILO) highlights that gig workers' working hours are long and unpredictable (De Stefano, 2015). In platform delivery, they are assigned tasks of delivery based on the demand. The key informant interview of a female delivery partner revealed that the companies don't assign delivery duties to women delivery partners in the evening. The major reason behind this is companies do not want the responsibility of the safety of the women delivery partners at night.

On the other hand, the roles that are not related to deliveries but demand flexible timings, studies show that, women find working in the sector difficult because of unpredictable hours. Apart from managing their unpaid domestic work at home, they get little support from their families to earn a living (Chaudhary, 2021) quoted by (Sardana et al., 2022).

- **Gender Discrimination in Remuneration**

While more women are joining the gig economy in such roles, they are paid less than men for the same jobs. According to Team Lease, there's an 8-10 per cent salary difference between male and female delivery executives, ranging between Rs 15,000 and 30,000 per month (Kar, 2019). In addition, many women, especially from disadvantaged backgrounds, lack bank accounts, limiting their financial independence. They are also often paid less than men, perpetuating the gender pay gap (Safetipin et al., 2024).

The key informant interviews revealed that some companies do not have pay discrimination, but women delivery partners lose the opportunity to earn more by working in late evenings, even if they finish their assigned task before time.

- **Absence of Health Benefits or Leaves**

Women belonging to the unorganised sector do not enjoy the maternity leave policy in comparison to women from the formal sector (Ghosh, 2021). Based on the surveys of women delivery partners of UrbanClap, a JIT service delivery company, - most women are highly dissatisfied with the lack of maternity benefits, poor incentives, and absence of insurance benefits (Chaudhary & Mitra, 2019). Many delivery partners work in the sector, often for less than the minimum wage and without rights like sick leave or weekly paid days. Most companies treat all delivery partners as on-contract staff and not full-time employees. Barring some examples like Zomato, most companies do not offer paid menstrual leaves.

- **Income Irregularity**

Although working on this platform offers a flexible work environment and financial independence, it also adds another challenge to earning a regular or stable income. A survey of food delivery partners conducted by (Iqubbal, 2021) highlights that most respondents entered the platform economy because of the lack of employment opportunities in other sectors. . It impacts women the most. Women earn relatively low wages, and a significant gender pay gap exists on some platforms. The lack of access to social protection and freedom of association has been a major challenge. COVID-19 has exacerbated many of these issues (De Stefano, 2015).

- **Dual Burden and Time Poverty**

The Gig and Platform Service Workers Union (GIPSWU) are India's first women-led gig workers' union. It is a union of gig workers working as delivery partners and other service providers. The union called for a nationwide strike during Diwali to call for collective action against unfair labour practices, including misclassification and biased ratings that lead to job insecurity (Bakhsh, 2024). The dual burden of professional and care work restricts women from committing to the demanding hours of gig work.

Women often have to leave their jobs when starting families and can only re-enter the workforce if they can arrange alternative care for their children or when their children's care needs decrease. (Safetipin et al., 2024). Time poverty restricts them to prioritise accepting short delivery trips and a smaller number of deliveries.

- **Lack of Unity Weakens Support and Protection for Platform Workers**

(AIGWU, 2024) critiques the 'NITI Aayog's platform economy report 2023' and highlights that the government does not guarantee labour rights, including wage protections, equal treatment, or diverse hiring practices, for women working in the platform economy. It merely suggests voluntary actions by platforms, with the government acting as a facilitator. Numerous studies also suggest that workers are exposed to several challenges whilst engaging in platform work, including a lack of social protection (Fairwork, 2023). They fail to maintain a steady income and face a poor working environment. During the pandemic out of the 13 platforms in India included in the report, only three (Amazon, Grofers and Flipkart) provided workers with pay loss compensation and only two (Uber and Ola) provided financial deferral of loans and other rental costs.

As mentioned above, men are earning more and can choose their working hours while working with online platforms. Time poverty challenge for women limits them from selecting work hours. But this comes with limited social benefits and less bargaining power as age-old issues of occupational segregation and gender pay gaps follow women into the new platform-based gig economy (Raman Shreya & Saif Rizvi, 2021). Besides, gig workers cannot unionise and have low bargaining power, which increases their vulnerability in the long run. (De Stefano, 2015).

While there are several small unions, data on formal women's gig workers association data is unavailable. (Dhonde & Patel, 2021) cited by (Galkin et al., 2022) argues that freight transport does not have a special cell or department looking after its challenges despite significantly impacting cities' overall livability.

- **Social Stigma**

(Fairwork, 2023)'s study in India revealed that local stigmas around divorce or single motherhood make platform work the natural choice for women in non-traditional family structures. However, entering the sector is not easy, as women are not welcomed in all types of gig platforms. Also, it is primarily believed that mostly women work in beauty and wellness or care work, and they are underrepresented in the delivery and ride-hailing sub-sectors of the gig economy. (Raman Shreya & Saif Rizvi, 2021)

- **Perception Challenges**

The perception of driving as a "masculine" job and the associated risks create significant internal and external barriers for women contemplating transport-based gig work (Safetipin & GIZ, 2024).

- **Navigation and Safety Challenges**

In the case of JIT services, all genders report experiencing discrimination and feeling unsafe, especially when it comes to working at night and going to neighbourhoods that are perceived to be dangerous. Interviews with women drivers across South Asia reveal that despite taking additional precautions—such as sending their location to friends, using familiar routes, and working mostly during peak hours—they face daily safety challenges (Safetipin & GIZ, 2024).

An interview with Namma Yatri company personnel revealed that since many women were unfamiliar with city areas, the inability to further navigate through GPS left women drivers struggling to understand destinations and routes (Safetipin & GIZ, 2024).

- **Unavailability of Safe, Secure and Hygienic Resting Points**

The absence of safe, secure, and hygienic resting points is another major hurdle for women in transportation gig work. According to Fairwork, women often struggle to find safe and hygienic facilities for simple needs like bathroom breaks (Safetipin & GIZ, 2024). A female delivery partner working with a renowned company highlighted that she finds it difficult to search for washrooms. The issue gets severe during menstrual cycles. In addition, every day, she needs to find a suitable place for having lunch.

- **Shortage of Public EV Charging Stations**

Shortage of public EV charging stations is a major challenge for decarbonising freight. A study by (Safetipin & GIZ, 2024) highlights that for many women, the lack of accessible public charging infrastructure translates to significant additional costs and risks. The cost of installing a personal charging unit at home is prohibitive, especially for women from disadvantaged backgrounds. Thus, the lack of EV charging infrastructure severely limits women's ability to participate in gig work.

4 Freight and Logistics from Women's Lens

4.1 Workforce Participation

4.1.1 Overview

Before analysing the presence of women in freight, it is important to understand overall women's workforce participation in India. Women's workforce participation in India is low compared to other countries. Figure 5 highlights that the percentage of women in the non-working category is high.

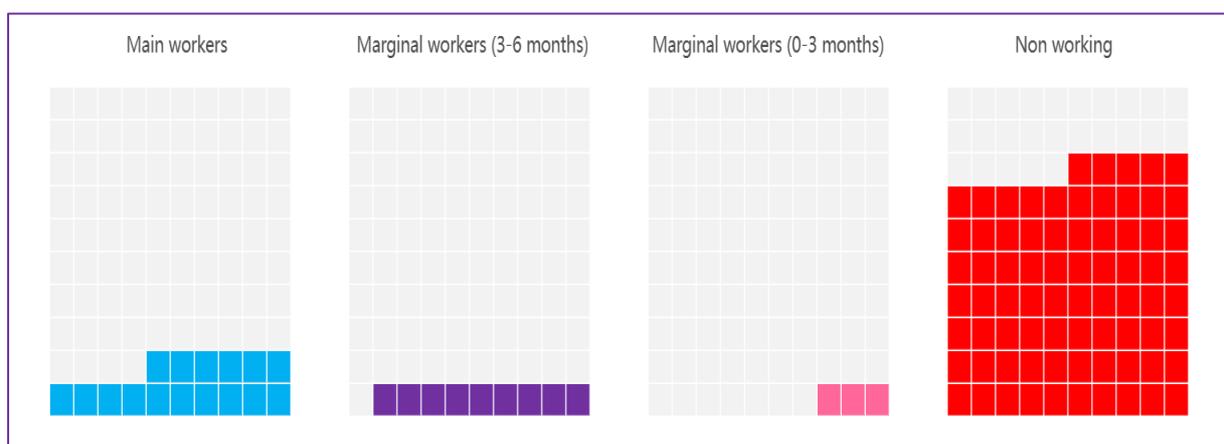


Figure 5: Population by Work Status Women⁷

The women's workforce participation rate in India has grown from 25 per cent to 34 per cent from 2020 to 2023. However, considering the global average of 49 per cent, women's participation in the Indian workforce is still low (World Bank, 2024) (Figure 6).

(Patwardhan, 2023) highlights that globally, women comprise 8 per cent of the workforce in the transport industry and 15 per cent in India. However, there are barely 27 women per 1000 compared to 117 males per 1000 in the transport industry. In the gig economy, the primary transport and delivery platforms engage approximately 3.3 million workers, including ride-hailing and delivery market; out of this, women comprise less than 1% of app-based ride-hailing and delivery drivers (IFC, 2018). The six largest transport and delivery platforms engage approximately 3.3 million workers, surpassing the 1.3 million employees of Indian Railways, the country's largest employer (Safetipin & GIZ, 2024)

⁷ Census of India, 2011

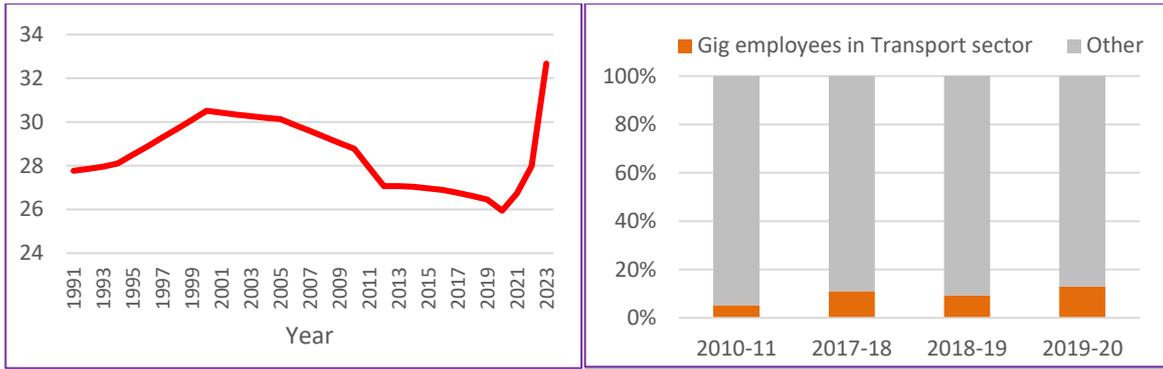


Figure 6: Female labour force participation rate in India, World Bank, 20248 and per cent of gig workers in transport vs other sectors⁹

4.1.2 Existing Policies and Programmes Promoting Women’s inclusion

The Ministry of Labour and Employment has launched various schemes and allocates funds for women's empowerment. The following schemes focus on women working in the unorganised sector or trading.

- National Policy for the Empowerment of Women (2001)¹⁰

This policy provides equal access to women's career and vocational guidance, employment, equal remuneration, occupational health and safety and social security. It also announces that women’s perspectives will be included in designing and implementing macroeconomic and social policies by institutionalising their participation in such processes.

Their contribution to socio-economic development as producers and workers will be recognised in formal and informal sectors (including home-based workers), and appropriate employment and working conditions policies will be drawn up. The JIT women workers fall under the ‘unorganised’ sector, and hence this policy can be a great tool to empower them.

⁸ (World Bank, 2024)

⁹ NITI Aayog, 2022

¹⁰https://prsindia.org/files/bills_acts/bills_parliament/2008/bill184_20080923184_National_policy_for_empowerment_of_women.pdf

- **Stand up India Scheme for Financing Women Entrepreneurs**

This scheme aims to facilitate bank loans between 10 lakh and 1 Crore to at least one-woman borrower per bank branch for setting up a greenfield enterprise. The list of enterprises includes trading. Apart from this, schemes like Pradhan Mantri Shram Yogi Maan-dhan (PM-SYM) are available. It is a pension scheme for unorganised workers to ensure old age protection for unorganised workers.

- **Pradhan Mantri Yojana**

Pradhan Mantri Mudra Yojana (PMMY) provides financial assistance to women-led non-corporate and non-farm sector income-generating small and micro entities, including truck operators. It ranges from INR 50,000 to 0.1 million.

- **Dena Shakti Scheme**

The Dena Shakti Scheme focuses on women entrepreneurs in agriculture, retail, manufacturing, small enterprises, and micro-credit organisations and provides loans up to Rs. 20 lakhs. However, data on women who availed of supply chain finance or loans for enterprises working in the logistics sector is not available.

4.2 Challenges for Women in Logistics and Freight:

4.2.1 Overview

According to a recent Gartner survey, women constitute approximately 39 per cent of the supply chain workforce globally (Kishore, 2024). Still, only 25 per cent of leadership roles in the supply chain are held by women (Vasal, 2024) In India, women's involvement in logistics is minimal. Fewer than 5 per cent of Indian working women participate in trade and trade-related services such as transport, logistics, and customs clearance, among others, compared with nearly 15 per cent of Indian men, as per Government of India data¹¹. (Dihel et al., 2023).

¹¹ mospi.gov.in/sites/default/files/publication_reports/AnnualReportPLFS2021-22F1.pdf?download=1

4.2.2 Key Barriers

- **Poor Representation of Women at the Senior Management Level**

The conventional form of urban freight is mail and parcel services by the Indian Post. As per their official website (India Post, 2024), the department manages the entire value chain from collection to storage to transmission to distribution across the country. It moves the shipments by road, rail and air. This department has a total of 170,653 employees, out of which only 19 per cent are women (Figure 7). (inuth, 2018)'s article refers to the Hindu's news and highlights that, in the male-dominated sector of delivery personnel, the first postwoman was appointed in 1959 in Trivandrum.

However, even after 65 years, the percentage of total female employees is still remarkably low. The number of female staff is highest in 'category C', which includes clerks, mail guards, and postmen or postwomen. The percentage of women in senior management is significantly low. (Department of Posts, Ministry of communications, 2022). It should be noted that the department announced its focus on women's empowerment, 'All Women Post Offices' and a step towards gender equality in 2022; hence, this percentage may increase in coming years (PIB Delhi, 2022b).

A senior government official highlighted that often, employers do not prefer women employees due the following perception

- Employers worry if women don't have the necessary skillset
- Employing more women means more investment in upgrading infrastructure
- A myth that efficiency and output of women may be lower than men

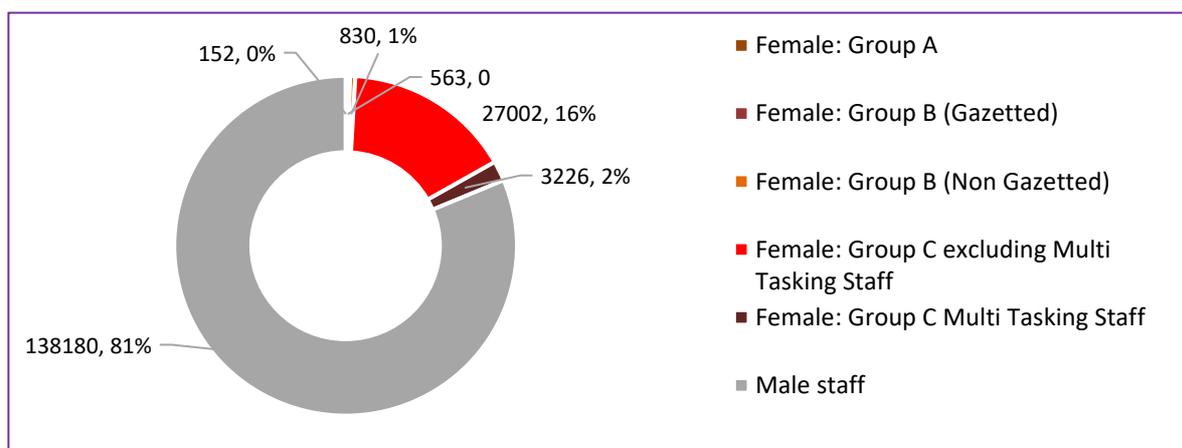


Figure 7: Group-wise Female Staff Vs Total Male Staff¹²

¹² India Post

Hence, a fundamental change in the mindset of all relevant stakeholders is required. On the other hand, one major barrier for women to join the sector is their safety concern. He adds that, a two-way strategy is required- skilling, and awareness of opportunities. It is important for a woman to identify the right place where her work will be valued the most. The NGOs can play an important role in helping aspirant women.

Apart from this, a representative example of the private courier company Blue Dart indicates that the sector has a gender imbalance. Overall, the percentage of women staff at Blue Dart is extremely low. Of 21,449 employees and workers, 5 per cent are women. Similarly, at the senior management level, 1 out of 8 boards of directors is female (Blue Dart Express Ltd, 2024). According to Blue Dart's press release, in 2021, the company established a centre in Navi Mumbai that is 100 per cent run by women (Blue Dart Express Ltd, 2021). Though progressive, considering the company's extensive operations, this initiative seems minuscule.

There are a few exceptions, where logistics companies are trying to increase the number of women employees. (Agarwal, 2023) highlights that her company, CJ Darcl Logistics, is trying to achieve gender balance within their staff. The marketing, human resources, information technology, and legal departments have a 1:1 ratio. However, the data on the representation of women at the senior level is not available.

- **Trucks Dominate the Freight Sector and Adversely Impact Women's Participation**

Higher dependency on trucks for freight movement also impacts women's participation in the sector. For instance, truck driving is a male-dominated sector. In 2022, newly issued driving licenses were over 10.5 million, barely 14.9 per cent for women. The overall cumulative valid driver licenses in India that year were over 236 million, of which 6.8 per cent were female drivers (Sun, 2023). In addition, the sector lacks support facilities such as a truck driving training institute for women.

- **Financial Burden and Lack of Working Capital for Women Traders in Logistics**

Women traders highlight that high working capital requirements are a barrier to participating. In addition, obtaining information on regulations and compliance processes, achieving export quality standards, and managing logistics service providers and bankers is harder for women than for male traders (Dihel et al., 2023).

(World Bank & World Trade Organisation, 2020) argues that globally, many women-owned firms are small, and they face the financial burden of compliance costs associated with procedures, regulations, and standards.

- **Lack of Formal Training**

A report by (NITI Aayog, 2022) states that 47 per cent of gig work is in medium-skilled jobs, about 22 per cent in high-skilled jobs, and about 31 per cent in low-skilled jobs. The trend shows that the concentration of workers with medium skills is gradually declining, and that of the low-skilled and high-skilled is increasing. In addition, the percentage of people aged 15-59 years who received formal vocational/ technical training in logistics is low— barely 0.3 per cent in urban areas. This percentage is almost NIL in the case of women. (Ministry of Statistics and Programme Implementation, 2022).

A policy brief by (Singla, 2023) highlights that participation of women is high in low levels of the supply chain compared to high levels due to gaps in education, skills, and training undermining women’s ability to engage and move to higher levels.

For instance, a delivery partner working with an e-commerce company highlighted that there is absence of any formal training with respect to gender and safety. The company provides training only on how to manage deliveries and helps them to get familiar with the routes and areas. She added that special trainings related to legal rights and personal finance management are essential and will enhance female delivery partners’ confidence and financial credibility.

- **Work Allocation Disparity due to Safety Challenges**

A delivery partner (KII respondent) raised a concern that women delivery partners do not get an opportunity to earn additional income. There is no pay disparity, but men are eligible to get additional deliveries in the evening which provides them an opportunity to earn more. Companies consider it as a precautionary measure to address women’s safety. Hence more than an equity challenge, it is an urban planning challenge for the authorities.

Women find it unsafe to access the streets that are not active. Better urban planning that promotes active frontages, mixed land use accommodating street vendors can help address this urban planning challenge.

- **Absence of Data-Driven and Study-Oriented Approach**

Most platforms completely disregard women workers' demands for workplace safety and grievance redressal mechanisms. In addition, there are safety concerns arising from their work pattern. For instance, the All India Gig Workers Union (AIGWU) highlights that they travel to unknown places and localities, where residents become suspicious of them (AIGWU, 2024). Women workers are particularly vulnerable to being exploited. The NITI Aayog (2022) report highlights the need to collect data on gender. (AIGWU, 2024) argues that data on the exploitation of women gig workers in the past must be collected and analysed to derive appropriate policy recommendations.

- **Unregulated Urban Freight**

Collecting data from large-scale freight transport operators is relatively easy, but for most of the major cities in India, urban freight transport is largely managed by Light Commercial Vehicles (LCV). Individual vehicle owners operate these LCVs, making it difficult for the government to regulate the sector (Dhonde & Patel, 2021).

4.3 Women and Decarbonisation Synergy

Total emissions from fuel combustion in the transport sector were 325.38 million tonnes in 2019 (Agora, 2023). Road freight is the biggest contributor to these emissions, responsible for 95 per cent of the freight CO₂ emissions in 2020. (NITI Aayog et al., 2021). Despite comprising only 3% of all vehicles, trucks are responsible for more than one-third of transport-related carbon dioxide (CO₂) emissions (Figure 8). This is particularly concerning given that road transportation accounts for a staggering 69% of overall freight movement in India (Government of India, 2024a).

Hence, in addition to operational costs, congestion, and road crashes, the freight and logistics stakeholders face additional pressure to reduce energy consumption and emissions footprint (Gota, S. and, 2021). The CO₂ emissions from freight transport were high, at 220 million tonnes in 2020. In a business-as-usual scenario, they could reach up to 1,214 million tonnes, almost 451 per cent growth! (NITI Aayog et al., 2021). The report further provides several reasons with references on how and why truck productivity in India is low compared to global standards.

For instance, trucks in India travel about 300 km per day compared to the global average of 500 to 800 km per day. Small trucks are often overloaded beyond their capacity and have high empty running rates.

This results in more driving to move the same amount of goods, causing high costs and, most importantly, higher emissions. (Kamboj et al., 2022) add that the use of old trucks is another primary reason behind high emissions. India has a booming secondary market for used vehicles. Trucks that have already been used for several years and are depreciated are often sold at a significantly lower price in the used vehicles market. Eventually, it results in more emissions.

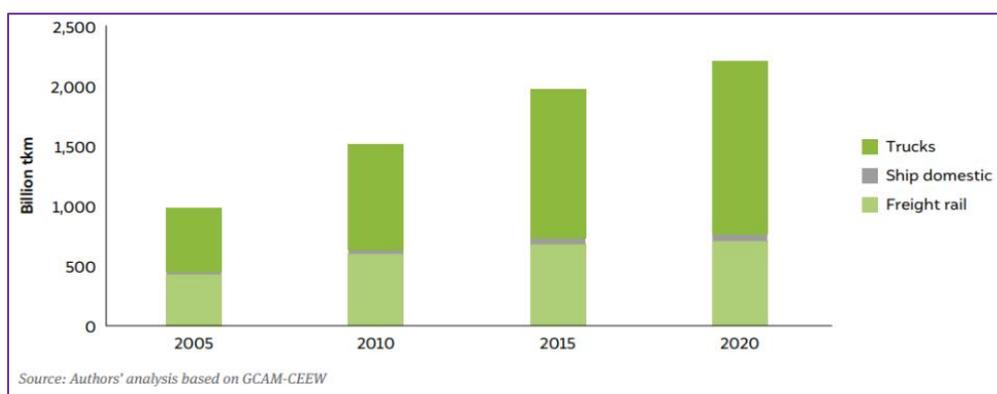


Figure 8: Freight Emissions by Category¹³

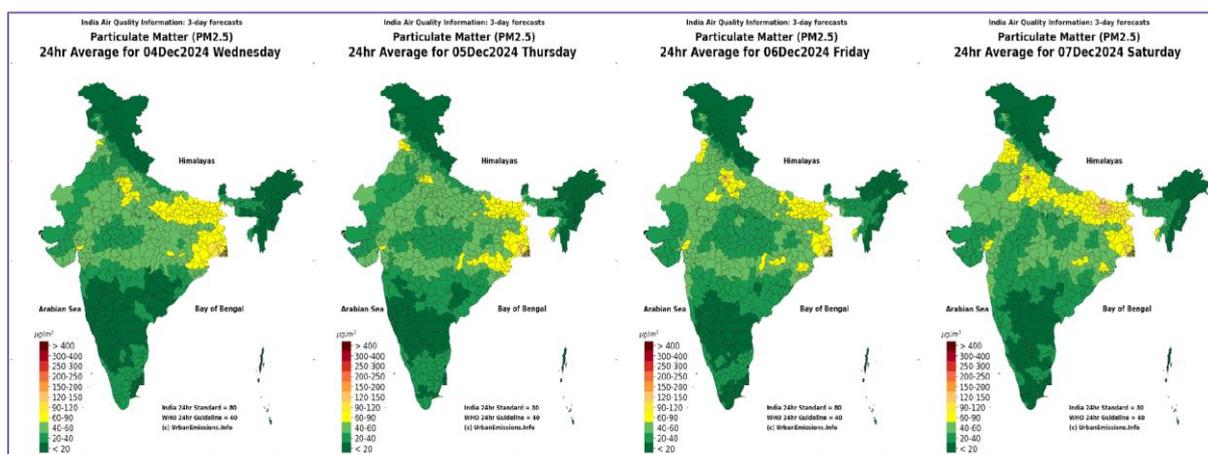


Figure 9: Air pollution in India¹⁴

Figure 9 provides details on district-wise emission levels. While the data on actual emissions only on highways is not available, it gives a glimpse of poor air quality in densely populated regions of India.

¹³ Kamboj et al., 2022

¹⁴ <https://urbanemissions.info/india-air-quality-forecasts/>

- India towards Decarbonizing Freight

As per India’s Nationally Determined Contributions, the country is committed to reducing the emissions intensity of GDP by 45% in 2030 relative to 2005 levels and achieving an economy-wide net-zero target by 2070. (Agora, 2023). Green Freight was first formally introduced in the Indian national policy-related discussions at the 6th EST Forum and Urban Mobility India workshop jointly organised by the Ministry of Urban Development (India) and the United Nations Center for Regional Development (UNCRD) in December 2011 (Gota, S. and, 2021).

Conference proceedings briefed by (Mulukutla et al., 2022) highlight that decarbonising freight is becoming easier due to the rise of start-ups. These companies provide models for various categories of freight vehicles. The key supply-side players in the e-freight segment are in Delhi, Bengaluru, and Hyderabad, the fast-emerging manufacturing hubs for e-freight vehicles.

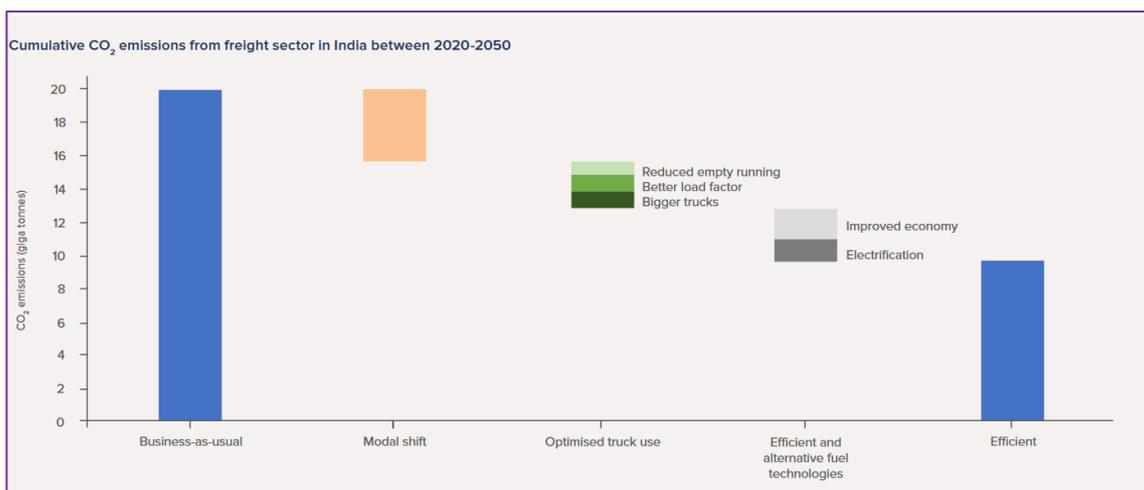


Figure 10: Cumulative Energy Consumption by the Freight Sector Between 2020-2050¹⁵

The report by (NITI Aayog et al., 2021) presents projected scenarios based on recommendations to reduce carbon emissions in the freight sector (Figure 10). The report mentions that freight emissions of 220 million tonnes can be reduced by ten giga tonnes over a BAU scenario by 2050 in three ways. Firstly, the mode shift will be to rail-based freight.

¹⁵ <https://rmi-india.org/insight/fast-tracking-freight-in-indiaa-roadmap-for-clean-and-cost-effective-goods-transport>

This can reduce CO2 emissions by 4.3 gigatonnes. Secondly, minimising truck usage to reduce empty running and improving load factors can reduce emissions by 2.8 gigatonnes in the following 30-year timeframe. Lastly, improving vehicle technology using efficient vehicles and EVs can reduce emissions by another 3.2 gigatonnes. To achieve India's ambitious Net Zero 2070 target, it is essential to complete a transition to zero-emission trucks (ZETs) by 2050 by pushing ZET sales penetration to 100% (Government of India, 2024a).

The government has announced initiatives such as NITI Aayog's e-FAST (Electric Freight Accelerator for Sustainable Transport). It actively facilitates collaboration between government stakeholders, private sector partners, and global non-profit organisations such as the Smart Freight Centre (SFC) to accelerate the electrification of freight in India. In addition, FAME II scheme provides incentives for replacing old ICE trucks with electric trucks.

- **Potential Job Opportunities for Women in Logistics**

The automotive sector in India continues to be one of the largest employers in the manufacturing sector. However, the sector has historically been male dominated, with women forming less than 15% of the workforce (Centre for Inclusive Mobility, 2024a). This report highlights that job opportunities for women are increasing in design, manufacturing, and leadership roles, including manufacturing through shop floor functions. In an interview with Money Control, Munira Loli Wala, AVP of Strategy and Growth at Team Lease Digital, mentions that India has approximately 400 EV manufacturers and an 11 million-strong workforce, with women accounting for 11-15 per cent of the workforce. (A. Sahu, 2024). (Mukherjee, 2024) highlights that, in the future, automotive firms are aiming for 30-50 per cent representation of female workers on their shop floors. While these vehicles include all types of EVs, women also have multiple opportunities in the Light and Heavy Commercial Vehicle segments of EVs.

In addition, (Centre for Inclusive Mobility, 2024) argues that women can work in critical areas such as research and development (R&D) to enhance vehicle range, establish and maintain a robust charging infrastructure, build localised supply chains, ensure a sustainable supply chain of electronic components, and continuously enhance safety aspects in EVs. The sector will also provide entrepreneurial opportunities and create on-hire contractual jobs like delivery partners in the freight segment.

4.3.1 Potential Job Opportunities for Women in Green Freight

“Freight to Zero: Decarbonising Urban Freight Transportation” was an agenda discussed in COP 28 among the global experts. The discussion highlights that the demand for urban last-mile delivery is expected to grow 78% by 2030, resulting in a 36% increase in delivery vehicles across the world's largest 100 cities. An expected tripling in the demand for freight by 2050 could double its 8% share of global GHG emissions.

Hence, transitioning to electric freight vehicles is among the key mechanisms for lowering these emissions as the electrification industry grows rapidly, it offers opportunities for women to work on research and development. (Centre for Inclusive Mobility, 2024a) quotes that women can build localised supply chains, ensure a sustainable supply chain of electronic components, and continuously enhance safety aspects in EVs. Considering the ease of using electric vehicles, this industry has the potential to attract women to work as delivery partners.

- **Soft Skills of Women are an Asset**

Saurabh Deep Singla, chief people officer of Ecom Express- a fast courier service in India, highlights, “We hire women not just to improve diversity numbers, but their retention rate is higher. Women associates are sincere, diligent, highly focused, and very efficient.¹⁶” The company has more than 2,000 women working at its hubs and fulfilment centres, and about 100 women are in delivery roles.

According to a woman leader Sulajja Firodia Motwani, CEO of Kinetic Green, whose company specialises in electric three-wheelers, “Women bring in a good form and type of leadership, good companionship and an inclusive approach to doing business, said Acharya of Convergence Energy. This is a new technology, and women are a lot more confident about indicating what works and what does not, and show great willingness to listen and learn” Shadowfax Technologies is a company that works with multiple online marketplaces. It currently has around 6,600 female delivery partners (6.6%) out of its total delivery workforce of 100,000 personnel.

¹⁶ <https://economictimes.indiatimes.com/tech/technology/online-delivery-companies-rush-to-hire-women-riders-amid-increasing-attrition/articleshow/91108627.cms?from=mdr>

Overall, the market seems positive for hiring women in EV industry¹⁷. A senior government official highlighted from his experience that initially, car aggregators were reluctant to hire women, preferring them only for services like pink cabs. However, today, they agree that women are wonderful drivers. It is now a choice, not a compulsion.

- **Encouraging Zero Emission Last Mile Vehicles at City Level**

Around 2019, some delivery companies started hiring women as delivery partners (Government of India, 2024b). The food delivery company- Swiggy hired their first woman delivery partner in Pune in 2016 (Nair, 2019). Soon, the number reached 700 women as delivery partners. However, considering the total fleet of more than 0.1 million, the percentage of women delivery partners is minuscule. So far, its competitor Zomato has employed 500 women delivery partners (Kar, 2019). While these numbers seem low, they demonstrate that the trend is changing and that there is a willingness to hire women in logistics and freight.

The last-mile interventions generally fall within municipal boundaries and jurisdiction; hence it should be easy for the authorities to make them shift to cleaner vehicles. In addition, technology to improve efficiency, strategic locations of warehouses can reduce vehicle km. In addition the authority should develop facilities for women drivers- especially toilets and restrooms.

- **Consolidation or Micro-Consolidation Hubs at the Periphery**

These hubs can be in the periphery of the city from which the last mile should be taken care by electric vehicles. This can also attract women in urban peripheral areas to work with these hubs as delivery partners.

- **Development of Operational Models for Last-Mile Delivery**

Companies can adopt CAPEX or OPEX models for deploying electric vehicles for last-mile freight. The CAPEX model is being used by Domino's Pizza, who have purchased the e-2W fleet for their own operation (TERI, 2021). Similarly, delivery companies like Blue Dart etc can buy e-2W for women delivery partners. The OPEX model in waste collection is successfully running in many cities. A similar can be adopted for last-mile freight.

¹⁷ <https://respark.iitm.ac.in/women-taking-the-wheel-at-ev-companies/#:~:text=Women%20taking%20the%20wheel%20at,and%20Evolet%20founder%20Prerana%20Chaturvedi.>

The logistics or platform companies can work in joint ventures with operators of electric three-wheeler or electric cycle companies hiring women delivery partners. Apart from this, improving financial access to buy electric rickshaws can help to onboard more women delivery partners using e-rickshaws.

4.3.2 Case Studies and Examples of Women's involvement in Logistics or Decarbonisation

- **Towards Women Only Assemble for Electric Three-Wheelers, India**

While trucks dominate the freight sector, two-wheelers and LCVs dominate the urban freight. In the research on the role of autorickshaws in the freight sector, (Rao et al., 2023) argue that policymakers have heavily discussed the integration of passenger and freight transportation.

Researchers predict the benefits of integrating passenger and freight transport, which can help reduce emissions and improve vehicular efficiency. It should be noted that the electric auto rickshaw market is also growing rapidly in India (Mordor intelligence, 2025). One of the leading manufacturers in this segment – Piaggio Vehicles Private Limited (PVPL), has introduced an all-women workforce to assemble the Apé Elektrik range of electric three-wheelers at its Baramati plant in Maharashtra.

This type of vehicle falls under Light Commercial Vehicles- a vehicle used for urban and short-distance regional freight. The company has trained women on safety procedures, usage of tools, electric vehicles and the latest technology. Interestingly, they have also redesigned the workplace to make it more ergonomically suited and comfortable for women employees (News Desk, 2021).

- **Women for Driving Electric Three-Wheelers in Logistics**

In 2022, Mahindra Logistics Ltd. (MLL), one of India's integrated logistics & and mobility solutions providers, announced deploying women drivers for last-mile delivery cargo service on electric vehicles. out of 1000 current fleet of electric vehicles for the last mile mobility 3-wheelers, 85 per cent are electric vehicles (MotorIndia, 2022). Recently, in 2023, the company started an initiative with 11 women e-bike riders for its last-mile deliveries in Mumbai, Bengaluru and Nagpur¹⁸.

¹⁸ <https://hr.economictimes.indiatimes.com/news/workplace-4-0/diversity-and-inclusion/mahindra-logistics-onboards->

In addition, the company runs a program named ‘Udaan’, that aims to support women professionals who have taken a career break¹⁹.



Figure 11: Women Driven Electric Three Wheelers for Last Mile Connectivity²⁰

- Adopting Technology and Design for Women’s Comfort

A sustainable mobility expert highlighted that there are still many manual transmission buses that require significant physical effort to operate. Switching to vehicles with automatic transmission can make driving easier and increase opportunities for women. Policymakers should analyse the barriers and challenges faced by women workers and systemic interventions enhance women’s participation in the sector should be prioritised. For instance, the key informant interviews revealed that the Azad Foundation in Delhi worked with DTC to push for adjustable seats for women drivers. However, this should be embedded in the vehicle design itself.

- Gender Mainstreaming in Trade Facilitation Projects, Germany

Germany introduced a “Feminist Foreign Policy” document in March 2023. It includes ten guidelines that provide both context and impetus for action to Foreign Office staff – both within and outside the organisation. The German government supports ‘The German Alliance for Trade Facilitation’. Under it, a Gender Task Force has been set up to raise awareness on gender sensitivity in trade facilitation projects. The gender guidelines promote gender sensitivity and a “do no harm” approach.

women-e-bike-riders-for-last-mile-deliveries/96942592

¹⁹ <https://mahindralogistics.com/diversity-inclusion/>

²⁰ <https://www.motorindiaonline.in/mahindra-partners-with-edel-onboards-women-drivers-for-last-mile-delivery/>

In several projects, they claim to track key performance indicators (KPIs), such as the number of women expected to participate in the training and, thus, in their projects. By signing the Code of Conduct, the partners of the German Alliance and the Secretariat commit to acting in a gender-sensitive manner (Taneja, 2023). The website claims that the program achieved 49% representation in 2021 (Australian Trade and Investment Commission, 2024) .

- **Promoting Women in Exports- Creating Women Leaders, Australia**

The Australian Trade and Investment Commission (Austrade) provides a Women in Export Scholarship to senior businesswomen in an internationally focused role to attend Harvard Business School’s program “Disruptive Innovation – Strategies for a Successful Enterprise,“. This scholarship enables entrepreneurs with tools for strategic decision making. Austrade also provides networking opportunities for women in business by creating a platform that brings together women-focused businesses and networking organisations.

- **Sponsoring Women Interns in Rail Freight, Turkey**

As part of improving rail freight connectivity in Türkiye through the World Bank-financed “Rail Logistics Improvement” project, the Ministry of Transport and Infrastructure (MoTI) is running a female internship program. Since 2021, a total of 70 women have benefitted and have been working on multiple non-conventional jobs related to rail freight (The World Bank, 2023)

- **Chennai’s Initiative Towards Enhancing Women’s Needs**



Figure 12: Feeding Mothers Center at Central Bus Stand, Chennai²¹

²¹ A.Muralitharan; The Hindu

The bus depots in Chennai have designated spaces for nursing mothers since 2015 (The Hindu, 2016). The state transport undertakings (STUs) need to understand the specific needs of women who want to join the workforce. As per the news articles, these feeding rooms also have an attached toilet and can accommodate four- to six mothers and babies at a time. The authorities anticipated a positive impact on women's performance and encourage more women to join the sector. But further data is not available. However, this is essential for also retaining women in the sector.

5 Stakeholder Roles and Responsibilities

5.1 Stakeholder Mapping: Key Players and Their Role in Promoting Decarbonisation and Women’s Empowerment

The following flow chart represents the stakeholders considered for this study.

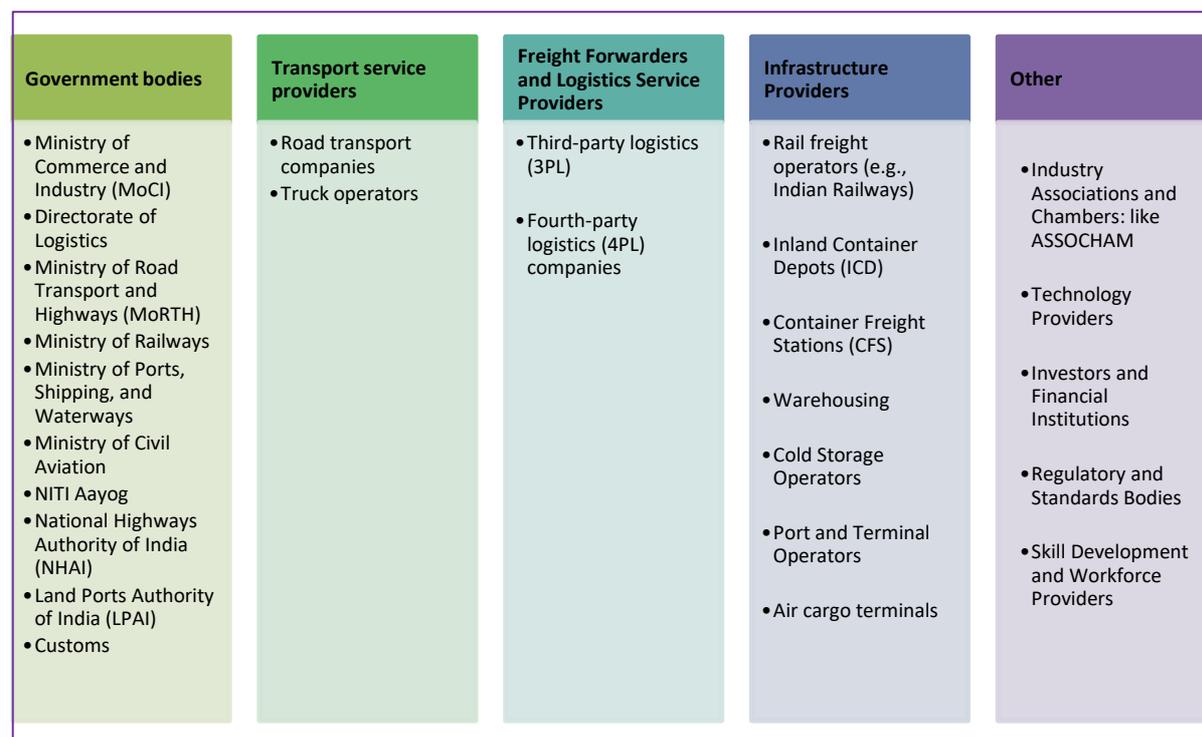


Figure 13: Stakeholders for the Study²²

5.1.1 Government Bodies

- Ministry of Commerce and Industry (MoCI)

This is an important ministry in logistics. However, its focus is on international trade. It has a women's cell that coordinates with the Ministry of Women and Child Development, and other agencies concerned with women's welfare and economic empowerment.

- Directorate of Logistics

The Directorate of Logistics is under the Ministry of Finance. This nodal agency monitors the logistical requirements of field formations regarding anti-smuggling, communication, and marine. It is also the apex organisation dealing with matters relating to Indian Customs.

²² Author

- **Ministry of Road Transport and Highways (MoRTH)**

MoRTH, an apex organisation under the Central Government, is entrusted with formulating and administering policies for road transport, national highways, and transport research to increase the mobility and efficiency of the country's road transport system. The Ministry has two wings: the Roads and Transport. Since it primarily deals with roads and transport, it is instrumental in drafting the Motor Vehicle Act, schemes for the safety of women bus passengers, etc.

The amendment of the act in 2022 has introduced a definition of aggregators and clauses related to types of permits. Concerning freight, the act describes goods carriage permit considerations, road safety, penalties associated with violations, types of goods carriage, and powers of the state department concerning rules for freight.

- **Ministry of Railways**

Ministry of Railways majorly deals with financing the creation of infrastructure, overseeing operations, and formation of policies on rail-based freight. It works also on improving the share of rail-based freight by providing discounts and announcing schemes. There are multiple freight operators out of which the five operators dominate the sector²³.

- **Ministry of Ports, Shipping, and Waterways**

The Ministry of Ports, Shipping, and Waterways is a key government body responsible for formulating programs on concerned subjects and overseeing their implementation. This ministry actively promotes women's involvement.

- **Ministry of Civil Aviation**

The Ministry of Civil Aviation provides passenger and freight services, manages regulatory aspects, and prepares policies related to passenger and freight transport by air.

²³ <https://www.mordorintelligence.com/industry-reports/india-rail-freight-transport-market>

- **NITI Aayog**

NITI Aayog has been instrumental in framing policies and programme frameworks on logistics or freight. It is a think tank and knowledge and innovation hub. In the logistics and freight sector, Aayog has published various studies that present the sector's status.

- **National Highways Authority of India (NHAI)**

NHAI is mandated to implement, upgrade, and maintain national highway projects initiated by the government. It also provides consultancy, accelerates passenger and freight traffic by road, and improves the country's road network.

- **Land Ports Authority of India (LPAI)**

The authority works to facilitate land border trade, enhance connectivity in border areas, enhance Border Security, promote welfare schemes, and promote People to People Connect. As per their official website, a total number of 653,35124 trucks are used for freight movement daily.

- **Customs**

The Central Board of Indirect Taxes and Customs (CBIC) directs field offices to support in upskilling women logistics service providers and customs brokers as well as custodians of freight stations to ensure a safe and secure working environment²⁵.

5.1.2 Transport Service Providers

- **Road Transport Companies and Truck Operators**

All India Transporters Welfare Association (AITWA) is an association that works for the welfare of transporters. More than 300 companies are members of AITWA²⁶. As per their newsletters and website, they actively promote the decarbonisation of trucks²⁷.

²⁴ <https://lpai.gov.in/en>

²⁵ <https://economictimes.indiatimes.com/news/economy/policy/cbic-issues-circular-to-encourage-women-participation-in-trade/articleshow/108353997.cms?from=mdr>

²⁶ <http://www.aitwa.org/home/company>

²⁷ Numbers not available

- Rail freight operators (e.g., Indian Railways)

Indian railways allow private container operators for freight movement (NITI Aayog, 2018). According to various news articles²⁸, the five major operators are Indian Railways, OM Logistics Ltd, Shiprocket, V-Xpress, and Delhi Cargo Courier Services. An earlier section describes the involvement of women employees in rail freight.

5.1.3 Freight Forwarders and Logistics Service Providers

- Third-Party Logistics (3PL) And Fourth-Party Logistics (4PL) Companies

4PL transportation companies represent a form of business process outsourcing equivalent to contracting out human resources or financial functions. Third-party or 3PL logistics companies in India do not take ownership of the product being shipped. Instead, they act as intermediaries or managers between the two parties²⁹.

5.1.4 Infrastructure Providers:

- Inland Container Depots (ICD) and Container Freight Stations (CFS)

ICD and CFS offer services for containerisation of break-bulk cargo and vice versa. Most ICDs are connected by rail to the respective gateway port, while CFSs typically located adjoining or near the mother port and often do not have rail connectivity.

- Air Cargo Terminals

Like the other sectors mentioned above, women are also underrepresented in the air cargo terminal sector. The government report by PIB Delhi (2022a) mentions that though 15% of our pilots in India are women, this number can be further improved. However, a specific percentage of women in the cargo sector is unavailable.

5.1.5 Industry Associations and Chambers

There are various industry associations and chambers such as the Confederation of Indian Industry (CII), Federation of Indian Export Organisations (FIEO), Associated Chambers of Commerce and Industry of India (ASSOCHAM), All India Motor Transport Congress (AIMTC), Indian Private Ports and Terminals Association (IPPTA) etc.

²⁸ <https://www.mordorintelligence.com/industry-reports/india-rail-freight-transport-market>

²⁹ <https://expressroadways.in/blog/difference-between-4pl-and-3pl-logistics-companies-in-india/>

5.1.6 Technology Providers

Multiple players exist in this sector, including companies offering freight management systems, GPS and tracking solutions, Digital freight marketplaces and aggregators (e.g., BlackBuck, Rivigo), and Supply chain automation and AI-driven analytics providers.

5.1.7 Investors and Financial Institutions

Multiple public and private investors in logistics infrastructure and operations and banks offer financing solutions for vehicles, equipment, and operations. They offer supply chain finance, warehouse loans, business loans, and more. In addition, multiple government schemes offer loans for women entrepreneurs.

5.1.8 Regulatory and Standards Bodies

The Bureau of Indian Standards (BIS) develops and publishes Indian standards, implements conformity assessment schemes, recognises and runs laboratories for conformity assessment, implements Hallmarking, works for consumer empowerment, conducts capacity-building programs on quality assurance, and represents the country in ISO and IEC.

5.1.9 Skill Development and Workforce Providers

There are several institutes, including the government-established Indian Institute of Logistics. Besides this, several other institutes, like IITs, IIMs, and the Chartered Institute of Logistics and Transport (CILT), also design courses on various logistics-related topics. The CII Institute of Logistics (CII-IL) is a Centre of Excellence established by the Confederation of Indian Industry for training courses in the Supply Chain sector³⁰.

5.2 Role of stakeholders in promoting both decarbonisation and gender equity

5.2.1 Presence Of Women Within Stakeholder Agencies

The availability of gender-disaggregated data is a major issue in evaluating the presence of women within different organisations. The available data highlights that there is scope for improving the percentage of women in all organisations.

³⁰ Data on training courses specially designed for women candidates/ reservations/ other facilities is not readily available.

According to the report (Ministry of Civil Aviation, 2023), 1,913 women (barely 12% of the total) and 13,713 worked in different departments under the ministry. The report does not specify the bifurcation of initiatives for women working in passenger transport vs. freight transport.

India Railways has a total staff of 1.3 million, out of which barely 7.71% (100,000) are women. This ratio at the management level is 11.3% (2063 female officers in total 18,263 officers) (Parihar, 2018). As per the news report, in 2024, this number went down to 99,809, with 2,037 loco pilots³¹. (Parihar, 2018) highlights that the lack of women-friendly infrastructure is a major reason behind women's poor participation in railways. It is never planned while keeping in mind the needs of women staff.

Globally, as well as in Asia, ports are dominated by men. According to a United Nations Conference on Trade and Development (UNCTAD) port performance scorecard, apart from the representation of women in management roles, women are underrepresented in all other categories in Asian countries.

For instance, the women's representation average is barely 21.3 per cent, slightly higher than the global average of 18 per cent. In operations, it is 32.8 per cent, while in cargo handling, it is 27.6 per cent. Only in management roles, this percentage is 53.5 (UNCAD, 2022). This percentage in India is lower than the Asian average. According to the Head of Corporate Communications – APM Terminals India, in the Indian port business, women comprise only about 12% of the workforce and are primarily employed in clerical and administrative tasks, with much fewer in technical, operational, and leadership responsibilities (N. Arora, 2024).

According to her, remote locations, travel, and safety concerns, particularly during night shifts, are some of the major deterrents that prevent women from entering the port industry. (Taneja et al., 2023) analyses 12 ports in India from a gender lens and highlights that very few women 'users', whether they are traders, transporters or logistics operators, visit the land ports for trade-related activities. The procedures and processes for cargo clearance are primarily handled for women traders by male intermediaries and logistics operators by male colleagues.

³¹ <https://economictimes.indiatimes.com/industry/transportation/railways/over-99-thousand-women-employees-in-railways-including-2037-loco-pilots-minister/articleshow/115980913.cms?from=mdr>

In addition, the CEO of Pro Connect Supply Chain Solutions Ltd, (Shankar, 2023), indicates that a sense of unsafe working environment, hiring bias, and inadequate horizontal career growth opportunities are other significant reasons behind the low women's participation rate in the port industry. However, (R. Arora, 2024) highlights that the global air cargo and logistics sectors have witnessed the participation of more women in the past few years due to an increase in the utilisation of advanced technologies.

5.2.2 Best Practises for Gender Inclusion

- **Campaigns, Schemes and Benefits to Increase Women's Participation**

In 2023, the Ministry of Ports, Shipping and Waterways initiated the 'Sagar Mey Samman' campaign to promote the role of women seafarers in India's Maritime Sector. The ministry's past initiatives on inclusivity have fostered a significant rise in women seafarers, achieving a tenfold increase in their numbers since 2014³². As per the report (Ministry of Ports, Shipping, and Waterways, 2024), the Seafarers' Welfare Fund Society (SWFS) provides a Maternity benefit scheme for women employees.

(Ministry of Civil Aviation, 2023) highlights that the ministry put women's requirements in the gender budget. There is no registration fee for women candidates in all recruitment activities, a hostel accommodation facility for single female employees, and maternity benefits for women, including surrogacy cases.

- **Capacity Building and Mentoring Program to Increase Women's Workforce Participation**

The Land Ports Authority of India is actively implementing the recommendations of the National Trade Facilitation Action Plan 2020-23 report on gender inclusiveness in trade. (Department of Border Management, 2023). According to this action plan, capacity building, connectivity, providing information and resources, organising mentoring programmes, and enhancing connection and communication with Indian businesswomen are key components (National Committee on Trade Facilitation, 2023). The Central Board of Indirect Taxes and Customs (CBIC) focuses on increasing women's participation in international trade and developing women-friendly infrastructure³³.

³² Exact numbers not available

³³ <https://taxinformation.cbic.gov.in/view-pdf/1003194/ENG/Circulars>

- **Establishing and Designing Women-Only Workspaces**

Maersk, a leading CFS company, has transformed one of its warehouses at the Container Freight Station (CFS) in Chennai into a women-operated facility. This initiative has increased women's participation to 13 per cent from 3 per cent. These women employees work in all operational roles, including loading/unloading, picking, surveying, security, housekeeping, administration, and forklift operations (Container News, 2024).

The air cargo companies are trying to introduce gender mainstreaming initiatives. For instance, Delhi International Airport Limited, a GMR Airports Infrastructure Limited subsidiary, has launched the 'Pink Shift' initiative. This initiative was introduced at all three terminals of Delhi airport, during which women staff handle one complete shift of eight hours³⁴.

- **Conducting Baseline Studies to Enhance Women's Workforce Participation**

The Confederation of Indian Industry (CII) has an independent committee on Women's Empowerment that works with industry to strengthen women's role and participation in the economic sphere and community affairs. This committee studies the participation of women in the industry. It highlights that more than 90% of women in India are engaged within the Informal sector with limited security³⁵.

The Associated Chambers of Commerce and Industry of India (ASSOCHAM) actively conduct studies on the requirements of women employees in the industry and organises events like 'Empower women, empower nation' that highlight the role of women in the industry.

- **Addressing Women's Needs in Design Standards**

As per their declaration, they follow gender balance, gender representation, and gender-responsive approaches while preparing standards.

- **Going Beyond Conventional Roles**

The women are also working in non-conventional roles, including Track Maintainers, Technicians, Loco-Pilots, Head Constables, etc, within Indian Railways. (Parihar, 2018)

³⁴ <https://www.gmrgroup.in/media/gmr-led-dial-introduces-all-women-shift-at-delhi-airport.aspx>

³⁵ <https://www.cii.in/COEWL.aspx>

- Preventing and Addressing Sexual Harassment

The Ministry of Commerce and Industry (MoCI)'s women's cell has published a handbook on sexual harassment of women at workplace. The Ministry of Ports, Shipping, and Waterways has an Internal Complaints Committee on Sexual Harassment to look after the grievances of female employees relating to sexual harassment. The Ministry of Civil Aviation has set up a mechanism to prevent sexual harassment in the workplace in line with the Sexual Harassment of Women Workplace (Prevention, Prohibition and Redressal) Act, 2013.

6 An Overview of National Policies for Platform Workers

6.1 Existing policies

6.1.1 National Urban Transport Policy

The National Urban Transportation Policy (NUTP), 2014 highlights that cities often forget the presence of freight movement on streets. It recommends that goods movement be planned so that it does not affect passenger movement. (Aggarwal, 2014). However, (Gota, S. and, 2021) criticises that the policy does not acknowledge the need to reduce urban freight emissions due to health impacts resulting from air pollution. The latest version acknowledges gender aspects in public transport, but neither version acknowledges the gender aspects related to freight. Just-in-time is a new sector that needs to be accommodated in the upcoming policy versions.

6.1.2 National Logistics Policy, 2022

The National Logistics Policy (The Gazette of India, 2022), launched in 2022, targets reducing logistics costs, improving logistics performance index ranking, and adopting a data-driven approach to an efficient logistics ecosystem. It also highlights the need for human resource development and skills, pointing out that logistics efficiency is a function of human resources (PIB Delhi, 2023). It recommends that various departments develop an overarching logistics human resource strategy and action plans on skill development and internal capacity building. However, the policy does not specify any measures to improve women's involvement in the sector.

6.1.3 The Code on Social Security, 2020

This is an important document concerning various employees and staff on contract working in freight. For the first time, the code included the definition of "gig economy" which is strongly associated with urban freight. It describes the "aggregator" as a digital intermediary or a marketplace for a buyer or user of a service to connect with the seller or the service provider. It also acknowledged 'logistics services' as a separate sub-sector under aggregators.

As per the code, "platform work" means a work arrangement outside of a traditional employer-employee relationship in which organisations or individuals use an online platform to access other organisations or individuals to solve specific problems or to provide specific services or any such other activities which may be notified by the Central Government, in exchange for payment and "platform worker" means a person engaged in or undertaking platform work. Section 141 of the code (Government of India, 2019b) recommends creating the Social Security Fund from the funds raised by aggregators for the social security and welfare of unorganised workers, gig workers, and platform workers. It also describes the rights of personnel working in the gig economy.

However, apart from providing maternity leave for 'women employees', it does not specifically address the needs of female staff gig or platform workers. The code mandates that the Central Government constitute a National Social Security Board for unorganised workers, which shall adequately represent women.

- **Code on Social Security, Karnataka**

The Government of Karnataka has established a 'Code on Social Security' in 2020 as per the national code (Government of Karnataka, 2022). The Draft Bill mandates aggregators to register themselves with the Welfare Board and provide the latest data of all gig workers engaged by them within 60 (60) days from the enactment date of the law. It includes a separate section on registering women employees.

The Draft Bill envisages the establishment of the Welfare Fund for the benefit of registered platform-based gig workers, which is supposed to include sums received from welfare fees, contributions by individual platform-based gig workers, sums received as grant-in-aid from the State Government, all sums through grants, gifts, benefactions, bequests, donations or transfers and such other prescribed sums, and would be held, utilised and managed for the benefit of the registered platform-based gig workers.

Every aggregator would be required to quarterly deposit a welfare fee known as 'The Platform Based Gig Workers Welfare Fee' at such rate (in percentage) of the pay of the platform-based gig worker in each transaction or on the annual state-specific turnover as prescribed by the State Government. All payments generated on platforms is required to be mapped to a 'Central Transaction Information and Management System' administered by the State Government and monitored by the Welfare Board. In addition, the code establishes a grievance redressal mechanism for gig workers (JSA, Lexology, 2024).

However, the question of “whether the Government has set up the National Social Security Fund for informal sector workers and to improve the ease of doing business” was asked in Loksabha³⁶ in 2022. In response, the government states that adequate provisions have been made, and registrations on the e-SHRAM portal are active. However, more details, such as type of work, gender, and socio-economic background, are unavailable.

- **The Rajasthan Platform Based Gig Workers (Registration and Welfare) Bill, 2023³⁷**

In 2023, government of Rajasthan passes a bill to constitute a Welfare Board and to set up a welfare fund for platform-based gig workers, to register platform-based gig workers and aggregators in the State and to facilitate guarantee of social security to platform-based gig workers.

6.1.4 Draft National E-commerce Policy

The policy highlights the benefits of e-commerce, which has been instrumental in developing logistics sectors. It has also employed a significant number of people as delivery partners. (Government of India, 2019a). However, it does not emphasise human resources, capacity development, encouraging women to join the sector, social challenges, or addressing the challenges of delivery partners.

6.1.5 Policy Brief by NITI Aayog

- **India's Booming Gig and Platform Economy: Perspectives and Recommendations on the Future of Work**

This policy brief by NITI Aayog provides high-level data on the gig workforce and mentions that it is expected to expand to 2.35 crore (23.5 million) workers by 2029-30. The policy brief acknowledges that more significant data is needed to understand the difficulties faced by women-run platforms. The policy brief focuses on the need for Gender Sensitisation & Accessibility Awareness Programmes for workers and their families. It encourages the platform businesses and Civil Society Organisations (CSOs) to enable the mechanism for women to take up employment opportunities in the platform sector through skill development and access to finance and assets.

³⁶ <https://sansad.in/getFile/loksabhaquestions/annex/178/AU777.pdf?source=pqals>

³⁷ chrome-extension://efaidnbmnnnibpcajpcgiclfndmkaj/https://aioe.in/wp-content/uploads/2023/09/Gig_Workers_Bill_2023_1690274461.pdf

It suggests the CSOs to promote sensitisation on women platform workers' legal/ economic/ social rights. The policy describes incentivising women-led platforms or platforms that encourage recruitment of women employees and those with disabilities, but 'who' and 'how' remain unanswered.

6.1.6 National Trade Facilitation Action Plan

India's National Trade Facilitation Action Plan (NTFAP) lays out the reform agenda to meet the requirements of implementing the Trade Facilitation Agreement (TFA). It contains specific measures assigned to stakeholders with indicative timelines for implementation. The National Trade Facilitation Action Plan 2020–2023 (GoI 2020) specifically includes the promotion of "gender inclusiveness in trade" as an action point.

The action plan has developed a "Women in Global Business Program" that provides information, resources, and mentoring programs for Indian businesswomen. (Taneja, 2023) refers to the study on gender mainstreaming in Trade facilitation of G20 countries. As per the study, Saudi Arabia is the only country with a 100% score, reflecting the recent progress the country has made in implementing policies to eliminate various forms of gender discrimination (Figure 14). India's rating is the highest among developing countries (67%) (Taneja, 2023).



Figure 14: Overall Implementation Rate of Women in Trade Facilitation Measured in G20 (2021) (%)³⁸

³⁸ United Nations (2021) "Digital and Sustainable Trade Facilitation: Global Report 2021.

6.1.7 Existing Schemes and Programs on Decarbonising Freight

- e-FAST

e-FAST India (Electric Freight Accelerator for Sustainable Transport – India) is a platform to facilitate collaboration between government stakeholders and private sector partners — Original Equipment Manufacturers (OEMs), Logistic Service Providers (LSPs), financiers, producers, and Charge Point Operators (CPOs) — to shape strategies and actions that support freight electrification at scale (e-FAST India, n.d.). This platform raises awareness of existing policies and the need for freight electrification, leveraging learnings from global pioneers and enabling hands-on learning experiences and knowledge sharing by encouraging ecosystem development through quarterly meetings and working groups.

- PM E-Drive

It is a scheme by the Ministry of Heavy Industries. The Government of India (GoI) launched the scheme in October 2024, and it will be valid until March 2026. E-trucks will be eligible to get subsidies under this scheme. While the notification of the details of subsidies for e-trucks is yet to be published, total funds of Rs 500 Crore have been allocated for the same. Scrapping the existing ICE truck is mandatory to move towards the net zero targets. The incentive will be provided only against furnishing scrapping certificates issued by MoRTH-authorized registered vehicle scrapping facility(ies) for ICE trucks of equal or higher gross vehicle weight (Gazette of India, 2024).

6.1.8 Bharat Zero Emission Trucking (ZET) Policy Advisory

The Bharat Zero Emission Trucking (ZET) Policy advisory document is ‘advisory’ in nature, and it is intended to facilitate only debate and deliberations to ensure well-evaluated decisions on policymaking. However, the advisory provides pathways for net zero trucking, such as

- (i) Incentivisation Schemes: Financial support through direct and indirect financing will make ZETs more attractive to buyers.
- (ii) Regulatory Framework: Amending existing regulations and introducing new ones will provide clarity and signal market readiness for ZETs.
- (iii) Zero-Emission Refuelling Infrastructure: Tax credits and innovative service models are essential for establishing a reliable network of ZET charging and refuelling stations.

- (iv) Financing Solutions: Lowering interest rates, facilitating attractive loans, and diversifying financing streams will improve cost parity for ZET adoption.
- (v) Stakeholder-Centric: Increasing awareness and upskilling stakeholders across the freight ecosystem will foster trust and transparency in the transition.

6.2 Policy gaps

- **Representation Of Women in the Sector Is Not Well Acknowledged in Policies**

Several policies or advisories on freight and decarbonisation exist; however, they do not acknowledge the need or pathways to comprehensively increase women's participation in freight or decarbonisation.

- **Convergence of Policies and Programs Can Boost Women's Workforce Participation**

Most schemes or policies on women's empowerment do not specify incentives for women in freight. Convergence of schemes may help attract more women to work in freight.

- **Social Security Code and Fund**

The code or fund does not have specific provisions for women gig workers. While women face challenges in all sectors, the challenges of women gig workers must be addressed independently and under the social security fund.

6.3 Policy recommendations

- **Embedding Gender Inclusivity in All Policies**

The cabinet notes should have a small chapter on gender inclusivity to specify how it is stitched into the entire policy. Integrating gender inclusivity will take time but this should be initiated on priority. Embedding gender inclusivity at the national and sub-national levels is not sufficient, it is equally important to sensitise private players to develop a system where they are proud of their women workforce.

- **FAME II Can Have Additional Incentives for Women Truck Drivers**

Like the RAAHI program in Amritsar on e-autos, FAME II can include additional incentives for women drivers. Under the RAAHI program, a woman applicant is eligible to get a subsidy of 90 per cent of the total cost of an e-auto as against 50% for a male applicant³⁹. In addition, E-FAST initiatives should focus on involving women in logistics.

- **Comprehensive Mobility Plans Should Address Urban Freight as an Independent Topic**

The NUTP acknowledges the presence of freight; however, JIT is a new sector, and upcoming CMPs of cities should address concerns about JIT from a mobility and gender perspective.

³⁹ <https://www.tribuneindia.com/news/amritsar/pink-e-auto-scheme-for-women-drivers-launched-601112/>

7 Training Needs and Capacity Building

7.1 Skills Gap Analysis

- **Low Per Cent of Girls In STEM-Related Courses Impacts Their Participation in Logistics Technology**

The study by Oberai et al. (2023) highlights that girls are concentrated in life sciences within STEM while their presence is much lower in engineering. The B.Tech programmes, for example, consist of only 28.7 per cent women. It also mentions that the labour market is constantly changing and evolving, especially due to automation and Artificial Intelligence (AI). STEM education enables women to keep up with this transformation by giving them transferable skills. Overall, increasing the use of technology in logistics brings multiple opportunities for women and can enhance women's workforce participation in logistics.

The Society of Women Engineers highlights that, as per the report published by the Union Ministry of Human Resource Development in 2020, the percentage of girls was barely 27.3 for the Electrical engineering course⁴⁰. The major reasons behind the low percentage are a lack of awareness about this sector and a lack of role models — successful, highly-placed women engineers in the family, among acquaintances, and in the country. In addition, there is scepticism about joining predominantly male-dominated disciplines and organisations. The society also highlights that, often, girls lack confidence in garnering the required technical skills due to years of ingrained gender stereotypes and misconceptions.

- **Shortage Of Skilled Professionals Trained in Modern Logistics Practices and Technologies**

There is a shortage of skilled professionals trained in modern logistics practices and technologies (Cargo Talk, 2024). As described in the above sections, the percentage of skilled women in the Indian workforce is extremely low. Therefore, market demand should be considered while designing training courses for women. For instance, the CII Institute of Logistics (CII IL) is a Centre of Excellence established by the Confederation of Indian Industry. The Centre claims to work in the logistics sector to embrace apt digital technologies through capacity building of infrastructure and human assets for industry competitiveness.

⁴⁰ <https://alltogether.swe.org/2024/06/inwed-women-engineers-in-india/>

The centre is in the process of launching a program on the ‘Women Logistics Leadership’⁴¹. (Jhavar et al., 2014)’s study on the impact of skilled labour on the Logistics Performance Index (LPI) demonstrates the relationship between skilled labour and profit. The study highlights that investments in appropriate training programs and a better workplace can improve the retention rate. A skilled workforce positively affects corporate reputation building, recruitment, and retention of employees. In addition, the skilled workforce has a positive relationship with a reduction in cost, reduction in time, and improvement in reliability, flexibility, and safety of a logistics system. Overall, the skilled workforce has a positive impact on LPI.

- **A Lack of Skills Results in A Higher Attrition Rate Than a Replacement**

The skills gaps and multiple challenges are leading to severe attrition from the logistics sector. While a reasonable portion of the jobs, such as those in warehouses and middle or senior management, are amenable to women, the actual participation of women is very low due to skill gaps and poor working conditions (KPMG, 2007).

- **Lack Of Knowledge Can Lead to Harassment in Various Ways**

(M. Gupta et al., 2018) points out the skills challenges faced by women working in cross-border trade. The researcher gives reference to (Brenton et al., 2011; Ndiaye, 2010; cited in Higgins, 2012, p. 2; Jones et al., 2007) and highlights that cross-border women traders from low- and mid-income countries have lower literacy levels, tend to have little knowledge about cross-border trade regulations and procedures, and also face higher levels of corruption, harassment, and rights violations at times of border-crossing. Hence, they must develop knowledge and capacity development training for them.

7.2 Capacity Development Opportunities

7.2.1 Role of Government

- **Engaging Women in Senior Leadership**

Initiatives like the International Maritime Organisation (IMO) 's “Women in Maritime Leadership” program empower women through peer-to-peer learning and networking. Furthermore, education and upskilling drive change in the port industry.

⁴¹ More data yet to be updated on <https://www.ciilogistics.com/cs-wll.html>

Educational programs, workshops, and seminars are being organised to raise awareness about gender biases and foster an inclusive environment. By promoting dialogue and challenging stereotypes, these initiatives aim to create a culture where both men and women feel valued and respected for their contributions. Similar programs need to be designed for road-based freight.

- **Demand-Driven Training and An Independent Institute**

The Ministry of Skill Development & Entrepreneurship provides skill training to women under the Craftsmen Training Scheme (CTS), Instructor skill training under the Craft Instructors Training Scheme (CITS), Demand-driven Short-term courses, Special programs for training the instructors of it is and Tailor-made courses as per industry demand⁴². While the overall percentage of women participating in government skill development programs is low, it showed a steep increase last year from 7.7 per cent in 2022-23 to 20.8 per cent in 2023-24 (Ministry of Skill Development and entrepreneurship, 2023). (Team NSN, 2019) highlights a significant presence in non-traditional roles such as in Electronics and Hardware.

There are many female enrolments (1.03 lakh) in this sector's field technician—computing and peripherals job role. However, it does not provide specific data on women trained in tasks related to the logistics sector. (Skill India, n.d.). The government can establish an independent logistics institute for women to conduct such courses. However, the institutes of their centres should be located in areas that are accessible to women in rural areas.

- **Designing Vocational Courses as Per Industry Requirements**

(Ratho, 2020) highlights that vocational courses should account for the future of work. According to the India Skills Report 2019, 40-50 per cent of “existing jobs which are transaction heavy will get automated”—e.g. financial services, manufacturing, transportation, packaging, and shipping. Hence, vocational courses should include modern technology and contemporary topics such as “auto analytics engineers” and “sustainability integration experts.”

⁴² <https://www.msde.gov.in/en/schemes-initiatives/schemes-initiatives-through-DGT/vocational-training-programme-for-women#:~:text=Women%20Training%20under%20Ministry%20of%20Skill%20Development,various%20socio%2Deconomic%20levels%20and%20different%20age%20groups.>

- **Mentorship and Sponsorship Programs**

Mentorship and leadership development programs are crucial in nurturing talent and empowering women to pursue careers in the logistics sector. Pairing aspiring female professionals with experienced mentors may provide invaluable guidance, support, and information on various career opportunities in the industry and networking opportunities. They help break down barriers, instil confidence, and pave the way for women to assume leadership roles within the industry.

- **Awareness Campaigns and Programs for Increasing Girl's Participation in STEM Related Courses**

As described in the earlier section, the percentage of women in STEM is still low. Securing reservations for girl candidates need to be supported by awareness programs to encourage girls to join STEM related courses. The role and contribution of women in STEM and their success stories need to be documented and used to raise awareness.

7.2.2 Role of industry

- **Access To Low-Carbon Mode Vehicles And Training for JIT Women Partners**

In most countries, the most visible platform workers are delivery partners who use motorbikes to make short-distance deliveries. Such workers are often men. Swiggy, an Indian food delivery platform, acknowledges that most women do not have access to motor vehicles or driver's licenses, impeding their ability to work on the platform. They encourage women to apply for a bicycle to deliver couriers (Fairwork, 2023). However, all companies do not offer such assistance.

A young female delivery partner working with a renowned company highlighted in her interview that she did not get any financial assistance for buying an electric vehicle. She managed to buy a vehicle from her savings. Prior to buying an electric vehicle, she used to hire a two-wheeler on Rs 4500 per month rent. With the advent of electric cycles and their ease of use, the platform companies can offer financial access and free riding training for women delivery partners.

- **Enhance Access to Technology**

Most platforms require women to own smartphones and have access to mobile internet. Delivery platforms may also require workers to own assets such as bikes. (GSMA, 2024) highlights that barely 30 per cent of Indian women use mobile internet, whereas the gender gap in smartphone ownership in India is 32 per cent. In addition, a large portion of women do not have unrestricted access to smartphones. Instead, these devices are shared with male family members who control when and how women use them (Fairwork, 2023).

According to the Observer Research Foundation (ORF), some platforms offer devices to improve women's access to mobile phones, but this is only a stop-gap solution (Raman Shreya & Saif Rizvi, 2021). The platforms can offer or facilitate the process for women delivery partners to access finances for buying a smartphone

- **Enhancing Financial Literacy of Women Delivery Partners**

The Swiggy- a major food delivery platform, launched the 'She the Change' campaign in 2024. Under this campaign, the company targets to onboard 1 lakh women delivery partners by 2030. In December 2024, the company announced a comprehensive financial literacy programme for delivery partners that will feature interactive training sessions led by Sebi-certified trainers, covering topics such as budgeting, investments, debt management, and understanding capital markets. Such efforts are expected to strengthen the financial power of women delivery partners by improving financial literacy (India Retailing, 2024).

7.3 Partnerships for Skill Development

Our research and discussions with stakeholders highlight that most freight, logistics, delivery companies focus only on basics of work-related training. The companies periodically share mandatory training videos related to deliveries. They are linked to their performance score. Other topics like financial management, information on social security code and other skills that can enhance their performance and quality of life (Safetipin,2025) are often not included. Companies can partner with non-government organisations for conducting such trainings.

8 Emerging Trends and Opportunities

8.1 Trends That Can Reshape the Freight

- EV Adoption

(NITI Aayog et al., 2021) highlights that India can be a leader in advanced freight transport globally. This approach will bolster domestic manufacturing, enhance international competitiveness, improve air quality and road safety, meet India’s ambitious climate targets, and support the livelihoods of millions of citizens.

(Government of India, 2024) recommends policy interventions for adoption of zero emission trucking (Figure 15), such as – incentivisation (e.g. direct finance), regulation (e.g. standardisation in vehicle and battery technology), business and financing mechanism (e.g.- demand aggregation), better infrastructure (e.g. Quality and quantity of power supply).

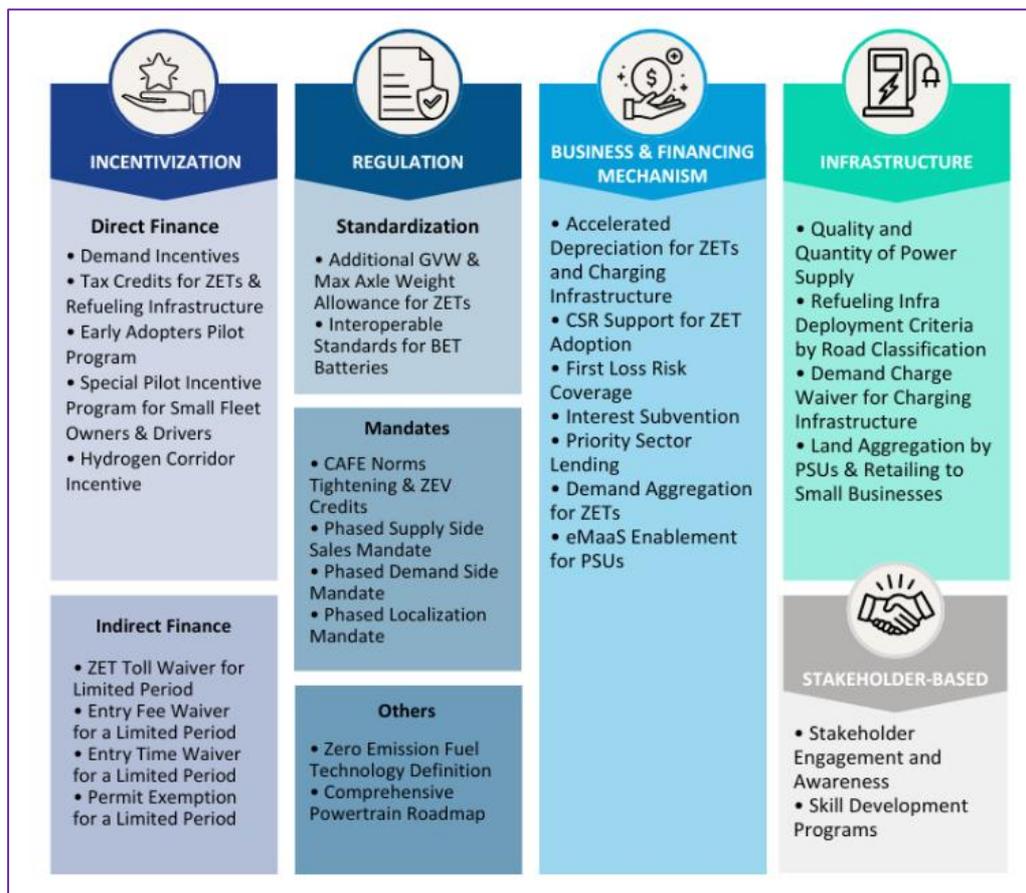


Figure 15: Classification of Policy Priority Areas for Development of ZET⁴³

⁴³ Government of India, 2024

(Pinjarkar, 2024) highlights that transition to ZET will create demand for specialised skills in manufacturing and maintaining electric powertrains, batteries, and advanced electronics. As mentioned earlier, these STEM oriented jobs will create multiple opportunities for women to join the transition to ZET. (Climate Trends, 2023) analyses EV policies in various states and argues that 6 states have defined targets for job creation in the EV sector namely, Andhra Pradesh (60,000 job opportunities), Telangana (1,20,000 job opportunities), Tamil Nadu (1,50,000 job opportunities), Bihar (10,000 job opportunities), Karnataka (50,000 job opportunities), Himachal Pradesh (numbers not defined). Chhattisgarh, Odisha and Delhi have goals to set up skill centres for providing necessary training.

- **Green Logistics**

(Maurya et al., 2023) refers to the study by Lee and Klassen (2008), and highlights that 'green logistics refers to an organisation's activity that integrates environmental considerations into supply chain management (SCM). Green logistics practises include evaluating the environmental impact of various distribution strategies and cutting back on energy use (Sbihi & Eglese, 2009 cited by (Maurya et al., 2023)). (NITI Aayog, 2018) highlights that logistical inefficiencies lead to reduced employment opportunities. World Bank research in Latin America showed that reducing the share of logistics costs in the final price of goods by 14% can increase demand for those goods by 8–18% and increase employment in that sector by 2.5%– 16%.

It further explains that resolving key issues in logistics can enhance safety and health and reduce the overall requirement for truck drivers while providing higher quality employment opportunities in other areas of logistics. (Maurya et al., 2023) highlights green logistics is a way to improve logistical efficiencies. However, the idea of 'green logistics' is still in its infancy in India and requires a lot of attention. The green transportation is an integral part of green logistics. It refers to a method for organising distribution with the use of environmentally friendly vehicles that enhances the performance of the economy, society and the environment such as electric vehicles for road freight.

Other practices include green packaging (eg. recycling, reducing waste etc), green warehouse and distribution (eg- limiting movement) and green value-added service (eg. utilising the most recent equipment and technology for green logistics).

- **Digitisation and Technology**

(Müller & Herzog, 2015) recommends that the transformation of logistical processes through electronic means of collecting, moving, storing, and manipulating data, information and knowledge or e-logistics, will equip companies with greater agility to deliver customer-configured products and value-added services faster than competition. E-Logistics is a dynamic set of Sensor (IOT), Communication (Internet, Mobile), Computing (Cloud), and Collaborative technologies that transform key logistical processes to be customer centric, by sharing data, knowledge and information with the supply chain partners and enable synchronisation of events and right decision making. (NITI Aayog et al., 2021) adds that there are a limited use of radio-frequency identification (RFID) tracking and a lack of real-time visibility into inventory flow. In addition, there is a lack of automation of common warehousing operations.

Hence, the government should continue investments in standardise and digitise logistics practices, invest in trucking technologies and advanced warehousing infrastructure, invest in digitisation and technology improvements of logistics infrastructure. Load matching or carrier assignment is the process where a shipper chooses a vehicle operator to ship goods. Improving load matching is critical to optimising truck use as it improves the quality of the match, removing wasted time and empty miles from the system. A digital freight-matching platform, where a fleet operator or logistics service provider is matched with a shipper using digital tools like web apps should be developed.

- **The Last Mile for Short-Distance Deliveries Is Attracting Women to Work as Delivery Partners**

According to Swiggy, the availability of short-distance delivery jobs is attracting many women. These jobs are mostly in the ‘instant delivery’ category. ⁴⁴ To attract more women to its last-mile fleet, Swiggy is allowing short-distance deliveries by bicycle. The company has 22% of its women delivery partners delivering on bicycles, but more details, like in which city, etc., are unavailable.

⁴⁴ <https://economictimes.indiatimes.com/small-biz/startups/big-basket-to-hire-more-women-at-distribution-centers/articleshow/61181180.cms?from=mdr>

- **Paid Period Leave for Women Employees**

The company -Swiggy- allows two days of paid leave a month for female delivery partners to voluntarily take time off during their menstrual cycle, with a minimum earnings guarantee during that time⁴⁵.

- **Use Of Latest Technology To Facilitate Women's Participation in Unconventional Roles**

Whilst women have always been employed in packaging and sorting activities in warehouses, men were still reliant on them for goods that were too heavy to be handled by women. (Women in the Logistics Sector and Their Challenges, 2022). Women operating heavy machinery like forklifts were previously unheard of; however, this is no longer true. In Ikea's Hyderabad and Pune centres alone, 18 female forklift operators are working successfully along with their male counterparts⁴⁶. In addition, women can now handle these tasks independently using latest picking and sorting machines. The logistics companies and warehouses should adopt the latest technology and get more women on board for multiple roles, including technicians.

- **Industries To Tap the Potential of Women Leaders**

A study by the Economic Times in India argued that companies headed by women grew at a compounded annual growth rate of 35 per cent compared to the 21 per cent annual growth rate recorded by the Bombay Stock Exchange (BSE) 30 companies. Their profit grew by 56 per cent in the last five years and recorded a much faster growth rate of 65 per cent in the last three years compared to 27 per cent and 23 per cent reported by BSE 30 companies for the same period. (Nigam, 2010).

A food delivery company, Zomato, and a leading automobile company in the freight sector- Mahinda and Mahindra, are on the list of BSE 3047. The logistics companies should tap this potential and consider promoting capable women to senior leadership positions.

⁴⁵ <https://economictimes.indiatimes.com/small-biz/startups/big-basket-to-hire-more-women-at-distribution-centers/articleshow/61181180.cms?from=mdr>

⁴⁶ <https://mahindralogistics.com/blogs/logistics-in-india-on-the-road-to-gender-diversity/#:~:text='De%2DGenderisation'%20of%20Roles,along%20with%20their%20male%20counterparts.>

⁴⁷ <https://www.bseindia.com/markets/equity/EQReports/TopMarketCapitalization.aspx>

8.2 Opportunities for Women in Semi-Urban and Rural Areas

- **Partnerships For Improving Women’s Participation in Supply Chain in Rural Areas**

More than half of the population works in the agriculture and agriculture-allied sectors, thus a part of global supply chains. Around 45 million employees work in cotton-based industries and drive a large export market. The programme “Sustainability and Value Added in Agricultural Supply Chains” (AgriChains) is operational in India by the Indian Ministry of Textiles.

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) is implementing it on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). With AgriChain, logistics companies and owner-operators can manage their entire fleet—scheduling loads to their drivers' phones, managing booking details, organising time slots, and automating Chain of Responsibility obligations.⁴⁸ While such initiatives are carried out in partnerships, they can prioritise women in rural areas and provide them with the required technology-related training.

- **Village Centres/ Workshops for Improving Women’s Participation in Rural Areas**

Specially designed village centres or workshops can help improve the workforce participation rate⁴⁹. For instance, In the Khargone district of Madhya Pradesh, the GIZ launched an initiative with the bioRe Association under the Agrichain program. The program aims to improve the bio-input supply chain and has 800 women. The project established community-owned input production centres on leased land.

These centres use locally available resources to produce organic inputs and botanical extracts at scale. Under another project of the Agrichain, in Gayvachharda Village in Gujarat’s Aravalli district, the Development Support Centre (DSC) prioritises women farmers for delivering training and providing necessary resources (GIZ, 2024).

⁴⁸ <https://www.rural21.com/english/archive/2021/01/detail/article/building-rural-capacities-in-indias-cotton-supply-chain-an-opportunity-for-womens-empowerment.html>

⁴⁹ <https://goodbusinesslab.org/project/adapting-the-supply-chain-for-rural-women/>

- **Flexi Hours in Supply-Chain**

The Institute of Supply Chain Management highlights that Compressed hours – Working longer hours per day for fewer days of the week, Flexible hours – Early in-early out or late in-late out, Part-time hours – Work fewer days a week than full-time employees and remote work – Not working from the workplace are the types available under flexi-hours in the supply chain.

The institute highlights that it can yield multiple benefits. For instance, the employees in the supply chain routinely control mechanical equipment, wield dangerous tools, move bulky objects, work from height, and navigate warehouse aisles bordered by pallets stacked a dozen or more feet. They are more likely to lash out in frustration or be overwhelmed by exhaustion if they feel they have no control over their work environment.

Offering flexibility provides an avenue to diffuse this pressure. In addition, flexi-hours can help improve loyalty, increase productivity, help maintain work-life balance and provide workplace diversity (Institute of Supply Chain Management, 2023). Such flexibility will help women in rural areas work more efficiently in the household and on the work front.

9 Recommendations

9.1 Strategic Interventions

- **Prioritise Women in Hiring**

The report by Team Lease (2024) estimates that 69 per cent of logistics companies plan to expand their workforce, and the industry has the potential to demonstrate the highest net employment change. It also estimates that a significant surge in hiring is expected for EV fleet managers, warehouse automation specialists, and last-mile delivery coordinators. Women have great opportunities to enter the sector. However, logistics, EV, and platform companies should be encouraged to hire women staff. In addition, companies that have more than a specific number of employees should hire a gender and inclusion expert to strategize women hiring.

- **Adopting Appropriate Retention Strategies and Dynamic Workforce Planning**

Only incentivising to hire women staff is not adequate. (N. Arora, 2024) highlights the need to re-examine recruitment and retention strategies to attract and retain aspiring women. Facilities like flexible work arrangements, childcare support, and equal pay policies may help create a more inclusive workplace. Women's unique challenges, such as work-life balance and career advancement opportunities, must be addressed. (Team Lease, 2024)'s report highlights that consumer-centric industries such as retail, e-commerce, and logistics are adopting a hybrid staffing approach and prioritising hiring women.

- **Inclusive Work Environment**

As mentioned in the above sections, infrastructure in the logistics sector should be planned considering women staff's needs. For instance, workplaces must be located in well-lit and safe areas. Provisions such as flexible working hours, and nearby accommodation for women who work late or irregular shifts, reducing the need for travel during vulnerable times could be helpful. (N. Arora, 2024) recommends partnering with local law enforcement agencies like police to raise awareness and provide support in these areas, making women safer and more secure in their work operations.

It should be made mandatory for private officials, to undergo necessary trainings on sexual harassment at workplaces. There is a similar program at the i-GOT platform⁵⁰, which provides training to government officials, on issues of sexual harassment, and a certificate is awarded on completion.

- **Compendium Of Good Practices for India and South Asia**

A compendium of good practices on women's safety and comfort at workplaces with a focus on freight and logistics can be a good guidance document. This document should cover various infrastructure, operations and strategy level interventions adopted by different companies to enhance women's participation in the sector. It should include a list of mandatory parameters for an organisation to be gender inclusive.

- **POSH Training Should Be Made Mandatory**

A senior government official highlighted that there are two parts to ensure women's safety at workplaces. One is preventive measures and the second is ensuring that women are aware of processes like filing complaints, their rights etc. Bigger firms follow Vishaka guidelines. However, they are mandatory and hence should be strictly implemented. In addition, it should be made mandatory and monitored if women know their rights and men too.

9.2 Infrastructure Improvements:

- **Design Facilities That Can Address the Need to Work Late Night**

An interesting study on women's workforce participation indicates that the percentage of women working in export-oriented manufacturing jobs declined sharply around the year 2000. The main reason was that employers wanted women to work for extended hours but were unwilling to bear the costs of alleviating risk in the workplace for female workers. (Ratho, 2020). Hence, designing well-lit spaces, secured restrooms, and providing late night commuting facilities are necessary to address the issue.

- **Design Workspaces According to the Needs of Women**

The logistics companies should proactively redesign the spaces according to the needs of women employees, such as toilets, creche facilities for small children, rest areas, etc.

⁵⁰ https://portal.igotkarmayogi.gov.in/public/toc/do_113569878939262976132/overview

Zomato has introduced an initiative called 'The Shelter Project'. Under this, the company will ensure access to clean drinking water, phone-charging stations, washrooms, and first-aid to delivery partners. Under this, the first two rest points were established in Gurugram (The Print, 2023). The platform companies can establish such rest points in partnership with dedicated women delivery partners.

Initiatives by the government on the safety of women travelling at night. The logistics and freight companies can work with the government to initiate "on-demand bus stop near home, late night services for women based on the commuting pattern of women employees. In addition, there are initiatives like an initiative by Pune police. They have created a helpline number for women to dial in if they are travelling alone during the night or if public or private transport is not available⁵¹.

A study by (Bhatt et al., n.d.) Recommends that patrolling vehicles that conduct random checks on buses, especially at night, and special police vehicles that can respond to cases of harassment of women reported either by the bus personnel or the passengers on the helpline number can ensure that the use of public transport agencies will be safer for women at night.

- **Addressing Needs of Women Through Better Infrastructure**

Making streets safer is crucial—well-lit, active streets with smaller blocks can help women navigate more easily. For women in freight, access to toilets is a major issue. Women bus drivers, for example, are often forced to use men's washrooms at depots and terminals. Well-lit, safe and operational public toilets with facilities such as resting spaces, breastfeeding areas should be available at delivery stations and warehouses.

Apart from improving access to toilets at petrol pumps etc, women need rest spaces that are more than just a toilet. They can use it during lunch hours, take rest during menstrual cycles. They can be clubbed with crèches that can support women in balancing their caregiving responsibilities, making it easier for them to stay in the workforce.

⁵¹ <https://www.punekarnews.in/pune-police-to-help-women-reach-home-safely-if-traveling-alone-at-night/>

- **Service Level Benchmarks and Safety Indicators for Different Spaces**

The government should develop and publish service level benchmarks and safety indicators for assessing gender responsiveness of workplaces, rest rooms and any other space meant for use by women in freight.

Data on qualitative and quantitative assessment should be collected periodically. Such datasets should include infrastructure, operations and policy related data such as rest rooms, special bus/ cab services at night, design norms etc. In addition, frequent audits of these spaces using the set of indicators will help to improve safety at workplaces.

9.3 Monitoring and Accountability

- **Adopt A Data-Driven Approach Towards Fostering Gender Equity**

The lack of data on women's participation and challenges in the logistics and freight sector is poorly documented. As per MoRTH (2022), the government has secured the budget for a study by the IIT BHU on "Developing a Data-Driven Practice Guidebook on Mid-term and Long-term Freight Traffic Forecasting in India." Similar studies should be conducted to periodically capture data on women's needs in the transport and freight sector. Such datasets are crucial for informing policy level changes. It should be made mandatory for both public and private companies with more than a specific number of women employees to collect and report data to the Labour Enforcement Officer. A sustainable mobility expert emphasises the need to collect qualitative data for supporting quantitative data. The qualitative insights – 'Storytelling' can be more powerful than numbers in changing mindsets.

- **The Government Should Encourage Platform Companies to Strengthen Platform Workers Financially**

(AIGWU, 2024) recommends that the government uses platforms for financial inclusion and mandate platform companies to deposit a certain amount of money above and beyond workers' existing incomes for their consumption.

- **Role of Governance**

The government can play a significant role in promoting women in logistics by enabling gender mainstreaming policies. (Nigam, 2010) highlights that Norway has made it mandatory for institutions to have 40 per cent of women on board.

Similarly, Australia enacted the Equal Opportunity for Women at Work Place law in 1999 and the Fair Work Act in 2009. The proportion of women increased from 6 per cent in 2007 to 10 per cent in 2009 after Spain enacted legislation to mandate a quota for women on Boards in 2007. While the quota system may be debatable, the government can introduce gender mainstreaming policies to ensure enhanced women's participation in the logistics industry.

- **Pool Of Funds Available for Private Companies to Encourage Women's Comfort**

While broad policies exist, they often don't translate into tangible outcomes. For instance, maternity leave is a great policy, but it doesn't apply to smaller entities. When the burden falls solely on employers, they hesitate to hire women, knowing they'll have to pay for six months of leave.

Some companies have even started asking women in interviews if they plan to have children in the near future. Instead, we need a pooled fund that all employers can draw from, ensuring that maternity leave doesn't become a hiring deterrent.

- **Bundling Social Good with Business Interest**

Aligning social good with business interests is essential. When they are opposed, the government needs to figure out how to work around it. For a large-scale social change, governments should develop an appropriate framework to ensure that the employer gets benefits for enhancing safety and comfort of women employees at workplaces. A sustainable mobility expert highlights that it has worked well in the housing sector.

The Slum Redevelopment Authority offers an additional floor space index to the developer for slum rehabilitation schemes. Similar can be worked out in the freight sector to increase women's participation.

- **Rewarding Gender Inclusivity Efforts**

The government should reward gender inclusivity efforts by private companies. For instance, awards like Leads and Leaps award for gender inclusiveness in the logistics sector. More such awards and schemes are essential. There is also the PM Kaushal Vikas Yojana which is a skill development program which supports women's workforce participation through skilling and this encourages companies to hire more women.

10 Conclusion

The study reveals ample opportunities for women in decarbonising freight and logistics industry. Transition to green logistics and freight will improve efficiencies and create jobs in emerging sectors of technology. Some key steps to enhance opportunities for women in decarbonising logistics and freight are

- **Collect Gender Disaggregated Data**

This shall be the first step in moving towards the goal of increasing women's participation in decarbonising logistics and freight. The government should prioritise collecting gender-disaggregated data, documenting good practices and formulating policies that address the needs of women.

- **Formulate Policies to Enhance Women's Participation in Green Logistics, Freight and Decarbonising Industry**

The gender disaggregated data will help the government to formulate specific women centric policies and set up goals to improve women's participation in the sector.

- **Enhance Percentage of Girls in STEM Related Courses**

Working at grassroot level is essential. The creation of jobs for women in the industry should be supported by supply side. Awareness programs to increase enrolment of girls from rural and urban areas in STEM related courses should be rolled out.

- **Role of the Government Owned Logistics or Freight Organisations**

The government owned organisations such as Indian Railways, India Post should set up annual goals to increase women's workforce participation.

- **Independent Skill Development Centres**

Some states have goal to set up skill development and training centres for EV related training. The Government of India should encourage other states to set up similar centres and support them with financial support. The skill development institutes or centres run by the government should be accessible to women in rural areas.

- **Private Sector's Role**

The private sector's policies should be to achieve the SDG goal 5 to "Achieve gender equality and empower all women and girls. "The training and capacity-building programs should address market demand.

- **Role of Non-Government Organisations**

The non-government organisations can join the hands with skill development centres or private industry. They can help the awareness campaigns.

- **Implementation of Social Security Code**

The national government should encourage all states to notify the State Level Social Security Rules on the lines of Karnataka. The database should be further used to enhance the opportunities and work environment for women gig workers.

- **Monitoring and Evaluation of the Social Security Code**

The implementation of the code should be evaluated annually. The evaluation should be based on the key performance indicators (KPIs).

- **Develop Guidelines for Designing Logistics Workspaces That Address Women's Needs**

Along with the policy, there is an opportunity to develop design guidelines that address needs of women in logistics. It should also include guidelines for facilities like restrooms for women delivery partners, toilets, creche and other areas.

- **One-Size-Fits-All Approach Cannot Work**

Gender inclusive state-specific policies should be formulated and implemented. One-size-fits-all approach may not work always. For example, states like Rajasthan which has low workforce participation and Tamil Nadu which has high workforce participation, will require different approaches. We can also have a regional approach, which can be more collaborative. For instance, in Rajasthan, more focus is needed to increase the women workforce participation rate whereas, in Tamil Nadu, more focus is needed to retain the existing women employees, encourage more women to join the sector and address their needs.

- **Measures to Increase Women’s Participation in Senior Positions**

The skill development centres should design courses to increase women’s participation in senior positions and leadership roles.

Overall, the government, private sector and NGOs should work together to increase job opportunities and address needs of women in decarbonising logistics and freight.

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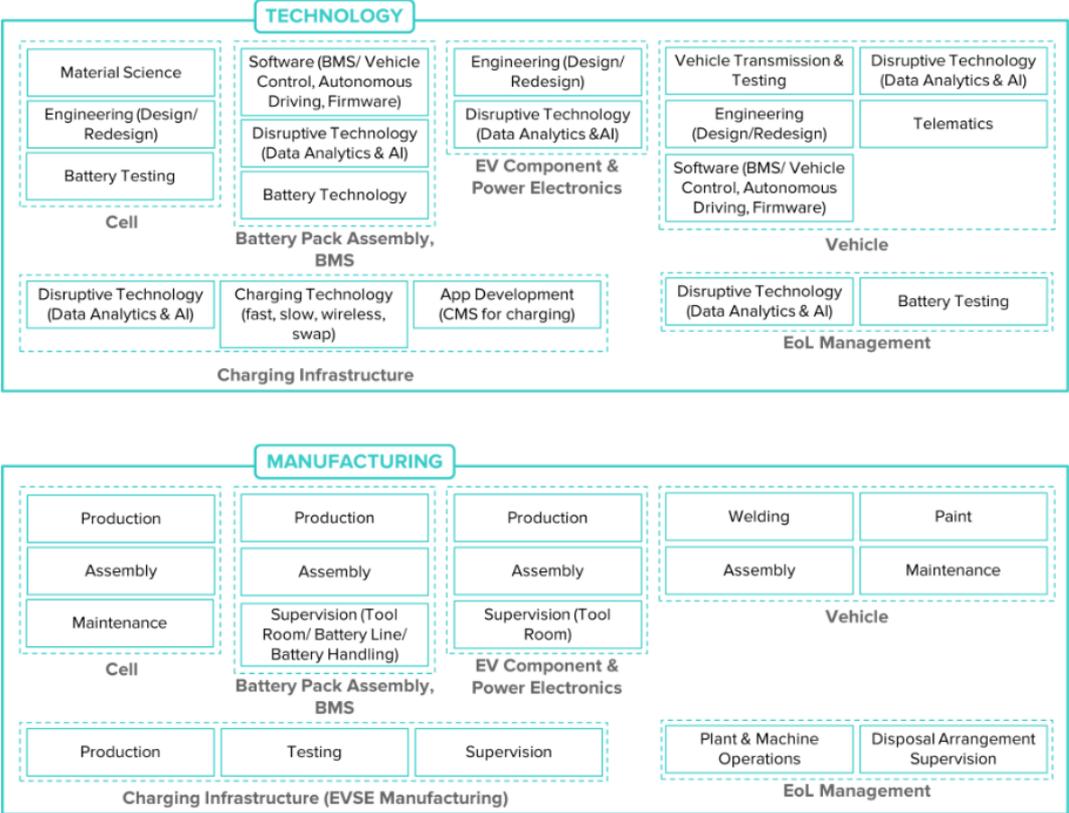
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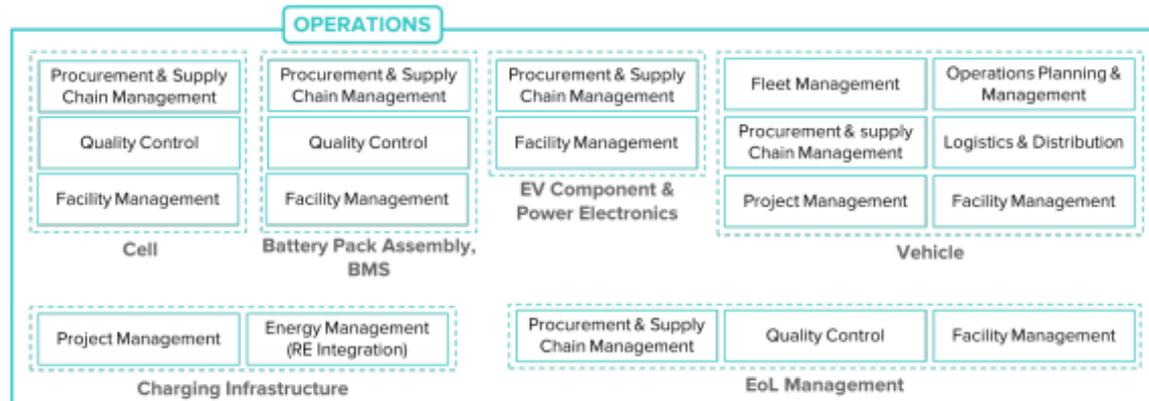
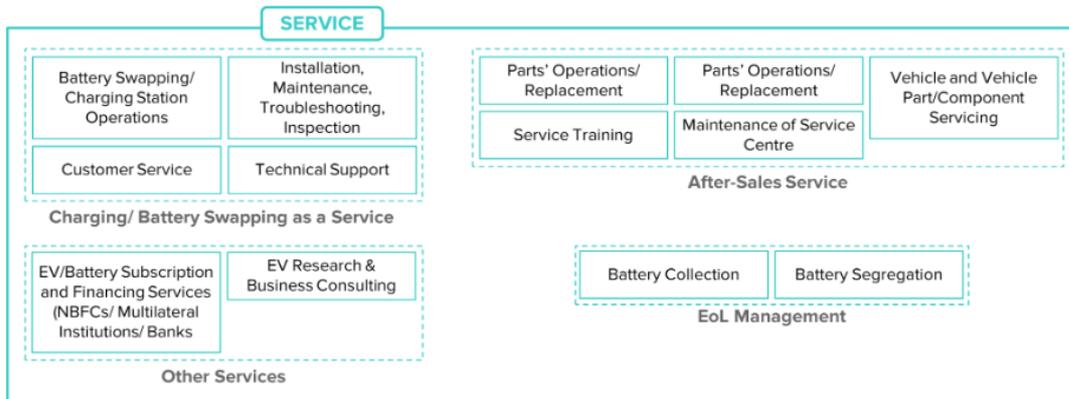
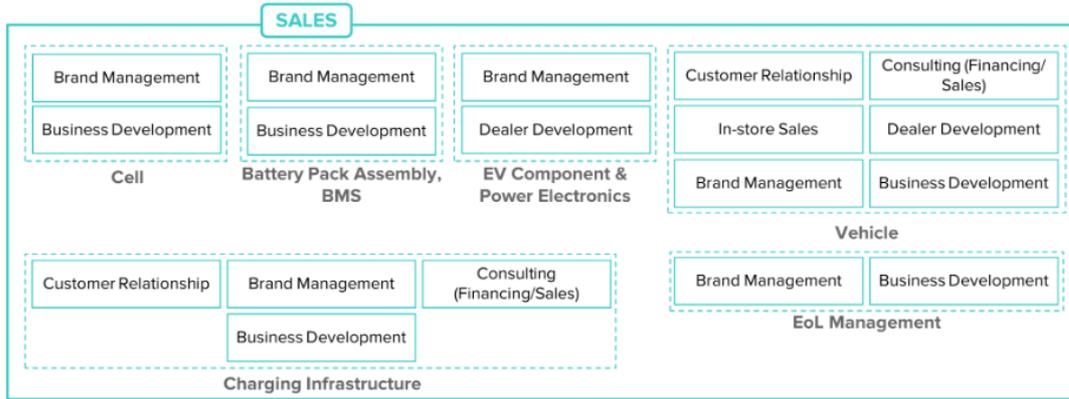
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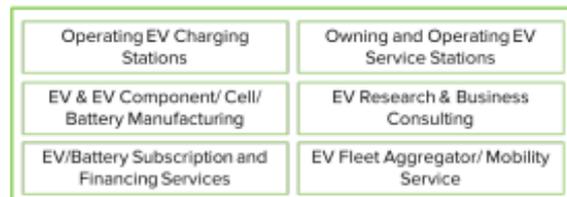
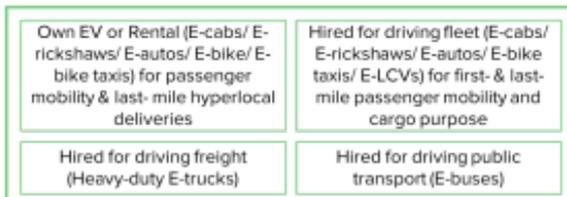
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12 Annexure A: List of jobs for women in decarbonising freight and logistics





FROM SHOP FLOORS TO LEADERSHIP POSITIONS



Source: (Centre for Inclusive Mobility, 2024a)