



GREEN LOGISTICS SKILLS DEVELOPMENT

Final report

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This report identifies gaps in job roles, training topics and tracks developed by Logistics Sector Skill Council across logistics sub-sectors necessary to comprehensively address skill needs for India's logistics sector. It also compiles training material and institutes offering green logistics courses.

GREEN LOGISTICS SKILLS DEVELOPMENT

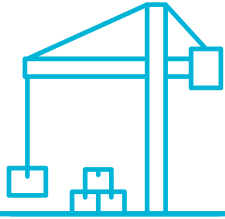
Final report

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01

Introduction



The Logistics Division of the Ministry of Commerce and Industry (MoCI), Government of India (GoI) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH are jointly implementing the Climate Friendly Freight Transport in India (Green Freight) project. As part of the International Climate Initiative and Indo-German Development Co-operation, the Green Freight project has been commissioned by the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV).

The objective of the Green Freight project is to provide strategies and technical solutions to the decision-making agencies at the national, regional/local level to develop freight transport in India in a climate friendly and efficient manner to support the India's Nationally Determined Contributions (NDCs). As part of the project, GIZ India would support national; state level partners and private sector in making the Indian freight and logistics sector climate-friendly and efficient.

Of the four key outputs namely,

01

Strategic and efficient freight traffic are established on a national and state level as part of the national logistics policy.

02

Measures for implementation in a selected logistics corridor from the national Action Plan for climate friendly and efficient freight traffic have been agreed upon.

03

The capacities for implementing measures for climate friendly and efficient freight traffic on an operational level have been improved in a demand-oriented and systemic way.

04

A method for measuring GHG emissions and emissions of harmful substances in the freight sector is applied in the reporting on NDCs.

An important component of Green Freight project is to improve the capacities for implementing measures for climate friendly and efficient freight traffic on an operational level based on the current demand and as agreed with the stakeholders. To institutionalise capacity development in recognised training institutes, GIZ would support these institutes in implementing the pilot trainings, assess the impact and adopt the modules.

GIZ identified following activities:

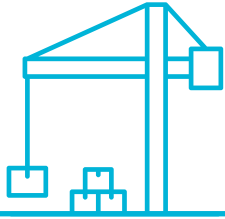
- Compile ongoing efforts on improvement of logistical efficiencies (such as in packaging, labelling, storing, eco-driving/transporting, etc.)
- Collate good practices (national and international) on greening logistics relevant to Indian context.
- Identify potential training topics that lead to climate friendly logistics and freight for road, rail, and shipping sectors.
- Compile/collect modules/training material used by reputed training and technical institutes offering logistics related courses for specific skill sets from available online sources.
- Review the policy/plan documents prepared by MoCI and provide inputs/comments with focus on climate friendly logistics/freight transport.

The interim report defined green logistics and structured the various greening measures for logistics. It also identified and briefly described the good practices on greening logistics planned and implemented by Indian and foreign companies across different industry sectors. In doing so, the report highlighted the ongoing efforts on improvement of logistical efficiencies by few companies on packaging and storing innovations to reduce wastage and environmental impact.

This report aims to identify the efforts undertaken by National Skills Development Council (NSDC) in developing Logistics trainings, trainers and institutional capacities with support of private sector. It also benchmarks it with international experiences and in the process identifies potential sub-sectors, tracks and job roles for developing content specifically related to Logistics and which have a potential scope for job creation.

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02

Methodology



To identify potential training topics for logistics and freight transport in the Indian context, the methodology employed was as follows:

- ➔ Assess empirical demand for skills in Logistics sector.
- ➔ Identify of Logistics Sub-sectors and map job roles by sub-sector.
- ➔ Identify new job roles required in Logistics.
- ➔ Review MSDC's approach for imparting Logistical skills
- ➔ Identify existing Skill Training Institutes and Their Capacities

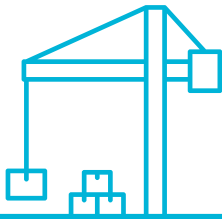
Besides, the report also identifies and informs about well-known international training programmes, curriculum and specific to green freight and logistics.





03

Demand for skills by logistics sub-sector



According to KPMG Report (Ramaswamy, Vilvarayanallur, and Kumar 2017), a number of drivers namely, rising investments, regulatory policies, mega infrastructure projects, etc. have reduced constraints and inefficiencies in the Indian logistics sector and thereby propelled Indian logistics markets in the last decade.

The transport and logistics sector are expected to grow at 1 – 1.5 times the GDP with EXIM expected to grow at 10 per cent with key trends of higher levels of outsourcing, increasing complexity of logistics requirements and adoption of global best practices. These trends are catalysing consolidation and development in the fragmented transport and logistics industry. The Indian logistics sector employs over 16 million employees and is forecasted to absorb another 28 million employees by 2022. The report mentioned that industry players have been incapable of investing in manpower development, Govt has also given it inadequate attention.



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16 Million employees

and is forecasted to absorb another **28 million employees by 2022.**

The demographic characteristics of workforce in the Indian logistics sector, as identified by National Sample Survey Office (NSSO) 68th Round Survey, indicate no clearly defined clusters for warehousing or logistics in the country. However, logistics activities are observed to be concentrated around metro regions particularly in Mumbai, Kolkata, Hyderabad, Delhi and Ahmedabad and Bangalore. Besides, the demand for skilled and trained workforce in the four transport modes (i.e., road, rail, air and water transport), other value-added service businesses also require skilled manpower.

Freight forwarding includes movement of cargo from manufacturer to end consumer. Freight forwarding has moved from freight arbitrage and customs house brokerage to end-end logistics solutions including warehousing, distribution and other value-added services. Its evolution has resulted in an increase of manpower demand with specific skill sets required to provide services in freight forwarding businesses. Likewise, the ocean freight and air freight businesses are also expected to create more job opportunities as that sector is forecasted to grow at CAGR 14 per cent in India.

Express Logistics includes time bound movement of cargo from/to customer. Most players in this space are into document courier services. Commoditization is forcing players to focus on providing value-added services and generate demand for specialised skills to ensure timely, guaranteed and safe goods delivery. With higher sophistication, scale and competition, the requirement for deeper skills at operational, middle and senior management levels are needed. With this sector valued at USD 3.5 Billion and expected growth at 16 per cent p.a., this is another sector that will require skilled manpower.

Air transport constitutes about 1 per cent of trade but accounts to around 29 per cent in trade value. This sector is concentrated in Delhi and Mumbai which together handle 50 per cent of India's domestic and international cargo. Despite being organised, its manpower needs training in soft skills essentially interpersonal and managerial skills. In Rail transport, freight volumes have grown at 5 per cent by volume cornering 31 per cent of total freight movement. With the Government as the main employer, a strong in-house training infrastructure can provide rotational job opportunities to its employees for working in other roles. Recent plans to open rail operations to private sector will create a spurt in trained manpower demand pulling rail employees into those services.

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Coastal shipping and inland waterways capture just 0.5 per cent of the total trade as compared to around 8 per cent in China and US. Work on reviving several National Waterways as potential inland waterways at Ganges, Brahmaputra, Godavari and Krishna rivers are in progress. This will lead to considerable manpower requirements in Inland Waterways to which trainings and employment of sailors will need scaling up.

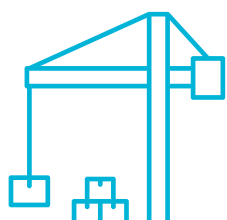
Road transportation contributes significantly to the transport and logistics sector. This mode of transport has majority of small entrepreneurs running family-owned businesses. Given their small scale of operations and investment, their focus is on short-term gains. Hence, investments towards long term measures such as in manpower development, have been minimal historically. Poor working conditions, low pay scales, poor manpower policies and unscrupulous practices have added to the segment's woes creating an un-attractive career proposition amongst the youth. With more organised approach towards transport and logistics activities due to emergence of global third-party logistics players, the demand for trained employees with specific skill sets is expected to increase soon. Majority of the logistics jobs in India are generated in road transportation segment largely covering truck / fleet operators, planners who plan the fleet management and supervisors who manage the fleet operations.





04

Successful Strategies for Logistics Skill Development



Logistics constitutes the key foundation for manufacturing trade and growth of any industry. It is a strategic component of every economy. The sector can also contribute to the creation of jobs. A competent logistics sector is vital for well-functioning trade flows, which contributes to a stronger economy and better jobs. In India, it is a \$160 Billion industry accounting for 22 million jobs with employment growing at 8 per cent annually.

In 2016 and 2018, the World Bank released Logistics Performance Index Report identified significant skill gaps in logistics sector, especially at managerial levels. For India, the key challenges identified were how to plug the skill gaps in Logistics and how this sector and its labour market can cope with rapid changes in the logistics sector brought about by rapid automation, technology deployment and e-commerce platforms. Germany, Netherlands and Singapore have managed these challenges effectively (Yin Lam 2018) by focussing on the following 3 strategies.

4.1 Systematic programme for building skills

Singapore launched a logistics skills framework in 2018 in which their government worked with companies to identify opportunities for professional development offered by the logistics sector from an operation executive to general manager. A Logistics Career Guide highlighting real success stories. This helps to inspire and retain employees, in a sector that often suffers from a reputation of poor progression. The guide also provides

specific information about the set of technical and general management skills required for various occupations, from freight inspector to logistics manager. In addition, local training institutes developed dedicated trainings to help interested candidates meet the specific skill requirements.

In Germany, the national government created a Freight Transport and Logistics Action Plan. One of their key initiatives ensured recruitment and retention of skilled workers by improving the image of the sector, informing interested candidates about the diversity of logistics sector jobs available, and ensuring good working conditions. The German government also awards the Freight Transport and Logistics Higher Education Prize to distinguish outstanding education courses.

4.2 Technology driven jobs re-design

New tech solutions like transport asset sharing platforms, big data, the internet of things, blockchain, etc. are profoundly transforming logistics as new innovations are disrupting supply chains (Tippng and Kauschke 2016). It is estimated that a third of all work activities will be automated by 2030. That means conventional logistics jobs across all sectors of the economy will not only need to adapt but will create entire new opportunities such as logistics big data analysts, drone operators, blockchain engineers, etc.

Under its Human Capital Agenda, the Netherlands established six Knowledge Distribution Centres (KDC) across the country. Those serve as knowledge hubs within different parts of the country, allowing universities to work with various parties to advance knowledge about technology, and make it more accessible to students/the local workforce.

4.3 Encourage Multi-Stakeholder Collaboration

For implementing comprehensive national training programme, it is important for Government to encourage all relevant stakeholders to pitch in: training institutes, logistics associations, private companies, and the employees themselves. Netherlands has developed an interesting feedback loop/virtuous circle between the industry, knowledge institutes, and the government.

First, the government funds logistics institutes like the Dutch Institute for Advanced Logistics. Those institutes act as focal points for the dissemination of knowledge to the industry, and the industry itself, in turn, helps inform the content of the training.

In Singapore, the Logistics Professional Conversion programme includes classroom sessions delivered by training institutes, mentorship by seasoned practitioners, and structured on-the-job training by employers. Workers are encouraged to embrace lifelong learning, and participants train and work concurrently at the companies.

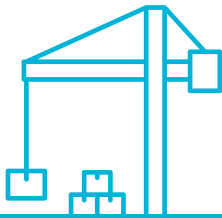
Germany has been successful in attracting and retaining the best available talent in the logistics sector. Germany has a well-structured dual education/apprenticeship scheme since decades to provide technical and operative workforces (McKinnon et al. 2017). The collaboration between vocational schools and logistics companies creates a theoretically- and practically educated workforce for a range of non-managerial positions. Germany's apprenticeship scheme trains students, many of whom get absorbed as employees in those companies. Due to the high level of education in the vocational schools, a career in technical and operational roles is well respected socially. The government regulates apprenticeships and defines the standards, methods of training and assessment. Committees including representatives from employers' associations and trade unions are involved they supervise the apprenticeship schemes.

The above strategies and institutional mechanisms offer direction to GoI for promoting and implementing quality logistics training and education thereby creating skilled workforce that will be in demand in Indian logistics sector.



05

Courses and Trainings on Logistics in India



There are very few formal training institutions for the size and scale of demand (See Table 1). With the advent of 3rd party logistics players and many specialised sub-sectors in logistics, the demand for trained manpower with relevant specialised skill sets is expected to only increase in the future. Existing institutes offer a wide variety of courses which include undergraduate, post-graduate, diploma and certificate courses in areas such as supply chain management, however they alone are inadequate to address the demands raised by the logistics industry.

Table 1: Recognised Institutions offering Logistics courses

Name	Location
Indian Institute of Management (IIMs)	Various
CII – Institute of Logistics	Chennai
National Institute of Logistics and Material Management	Udaipur
Indian Institute of Materials Management	Chennai
Karunya School of Business, Leadership and Management	Coimbatore
St. Xaviers College (SXC)	Kolkata
Institute of Logistics and Aviation Management (ILAM)	Mumbai
Institute of Logistics and Aviation Management (ILAM)	Bengaluru
Southern Academy of Maritime Studies	Thiruvallur
Global School of Foreign Trade	Madurai
Guiders Academy	Kochi

Name	Location
Indian Institute of Logistics	Kochi
Ashok Leyland	Chhindwara
Kaithal	Bhubaneswar
Tata Driving School	Various
Volvo truck training	Bengaluru
CRISIL	Various

Source: (Ramaswamy, Vilvarayanallur, and Kumar 2017)

In the above list there is a blend of institutes that offer academic courses at graduate and post graduate programmes on the one hand and skill training institutes offering specialised skills training suitable for industry demand. IIMs have core course modules on Supply Chain Management in their varied MBA programmes. Besides, they also offer executive programmes to Supply Chain Professionals to enhance their skills in digital technologies and analytics. IIM Bangalore has been actively pursuing Supply chain Management as a major area of teaching and research¹. More details on IIM Bangalore's course curriculum are available in the link provided in footnote.

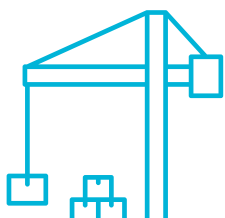
Notable amongst the institutes offering industry acclaimed educational programmes is CII-IL that collaborates with leading universities, colleges and educational institutions in Logistics and Supply Chain Management (SCM). From an array of learning options available – MBA programmes, embedded academic programmes, certificate courses, SCM Executive programmes and student chapter, interested applicants are facilitated to choose from available institutes and apprenticeship with Companies, like the setup in Germany.

Though Indian industries and industry associations have come to cater to the key requirements in the supply chain, logistics and road transport segment, some specialised segments like Information Technology in Logistics, Marine Services, Inland Waterways etc. seem lacking. Moreover, the institutional capacities and course offerings need to be greatly enhanced in sync with the requirements, size and scale of the logistics industry in India.

¹ <https://www.iimb.ac.in/centres-of-excellence/scmc> Sourced on 28th April 2021.

06

NSDC's Approach for Imparting Logistics Skills



Towards scaling up skills training for the Indian logistics sector, the National Skill Development Corporation (NSDC) along with Logistics Sector Skills Council (LSSC) has been at the forefront to design and catalyse industry relevant skill development trainings and placements in India. NSDC is a not-for-profit public limited company set up in 2008 by Ministry of Finance as a Public Private Partnership model. The Ministry of Skill Development and Entrepreneurship (MSDE), Government of India holds 49 per cent of the share while the private sector holds 51 per cent of the share capital. NSDC aims to promote skill development by creation of large, quality and for-profit vocational institutions. NSDC acts as a catalyst in skills development by providing funding to enterprises, companies and organisations that provide skill training. There are 37 sectors under NSDC's purview. Since its inception, the Sector Skill Councils (SCCs) play an important role in matching industry demand and skills training offered. The SCCs operate as an autonomous body. There are totally 36 SCCs in which Logistics Sector Skill Council (LSSC) promoted by Confederation of Indian Industries, Institute of Logistics (CII-IL) is a Centre of Excellence in Logistics with the aim to develop skill trained as well as up-skill the workforce in India.

NSDC primarily plays four roles

01

Funding and incentivising: NSDC financially supports select private sector initiatives to improve financial viability of their training programs. The exact nature of funding (equity, loan, tax breaks and grant) will depend on the viability or attractiveness of the segment and, to some extent, the type of player (for-profit private, non-profit industry association or non-profit NGO).

02

Enabling support services: NSDC enables skills development institutes in setting standards and accreditation systems in partnership with industry associations thereby enabling them to develop market-oriented curriculum, faculty training standards, quality assurance, technology platforms, student placement mechanisms and so in setting up standards and accreditation systems in partnership with industry associations.

03

Shaping/creating: NSDC supports large-scale participation by private players in skill development and attract potential private players and provide support to these efforts.

04

Communication and Advocacy: NSDC commissioned a series of films to increase awareness regarding various initiatives under Skill India Mission.

To cater to the diverse workforce and specialised skills required in logistics, the NSDC in partnership with Logistics Sector Skills Council (LSSC) have identified job roles and developed curriculums for a wide array of skill trainings for professionals in Logistics sector. An overview of Sector Skill Councils indicate that logistics and freight transportation trainings are available across different specialisations in 5 SSCs including LSSC totalling 108 Qualification Packs (QPs) spanning entry to senior level job roles (See Table 2). For a full detailed list of the job roles and QPs developed for logistics see Appendix A:

Table 2: Relevant Logistics QPs across different SSCs

Sector Skill Councils	QPs relevant to Logistics	NSQF Level
Aerospace and Aviation (Cargo Handlers, Security Execs, Reservation staff, Load Controllers)	19	3 – 6
Logistics	88	2 – 6
Agriculture (packers, Cold Chain technicians, supervisors, managers, fishing boat operators)	9	4 – 7
Automotive (Truck Drivers, Reach stack Operators)	4	2-4
Life Science (Export / Import Manager)	2	6

Logistics and transportation are ubiquitous across industry and therefore it is not surprising that niche job roles related to Logistics are developed in other SCCs like agriculture, automotive, aerospace and aviation and life sciences. The demand for professional workforce and infrastructure to manage and operationalise distribution of COVID vaccines and oxygen cylinders in India during the first and second wave have put the pharma cold chain logistics under spotlight and is forecasted to grow at an exponential rate in the near future.

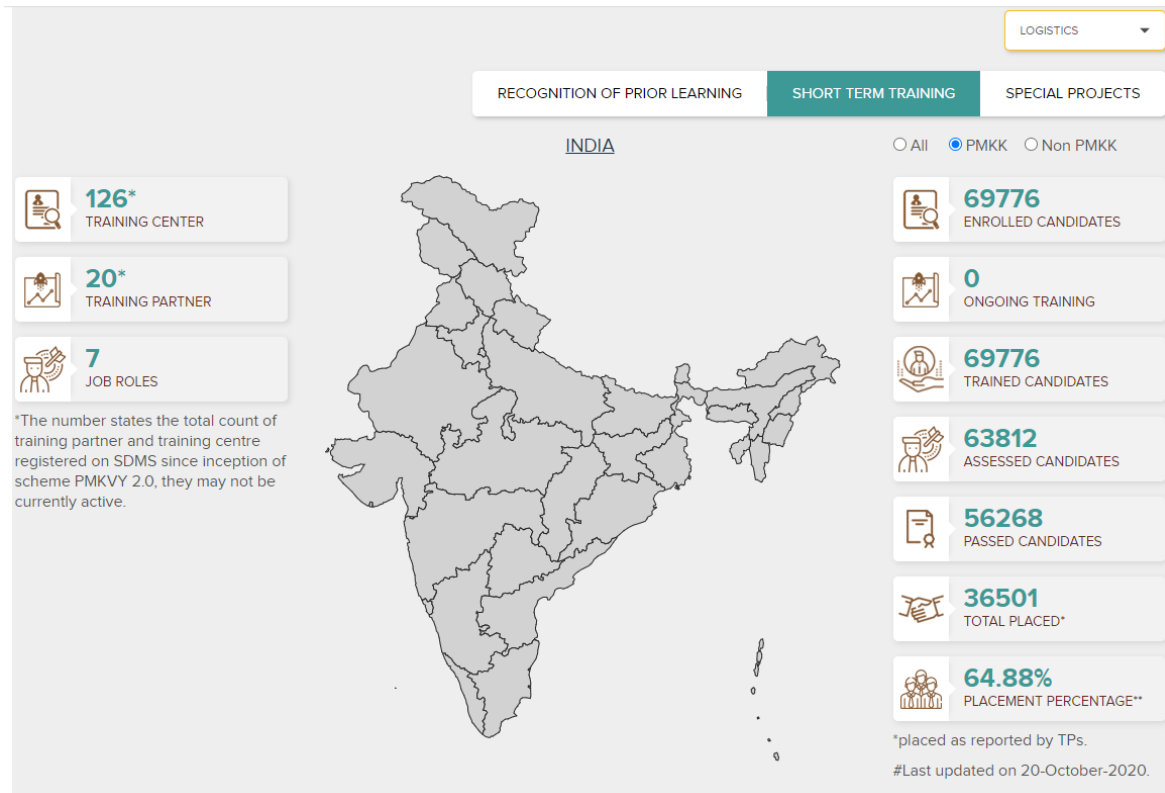
By February–March 2021, LSSC developed a total of 88 different job roles under the following sub-sectors:

Table 3: Job Roles developed under different Logistics Sub-sectors

Logistics Sub-sectors	Job Roles
Air cargo operations	3
Cold chain solutions	6
Courier and mail services	18
E-commerce	2
EXIM logistics, freight forwarding and customs clearance	9

Logistics Sub-sectors	Job Roles
Inland waterways and marine services	3
Land transportation	11
Liquid / fluid logistics	4
Port terminals, ICDs and CFS	5
Warehouse - storage and packaging	22
Grand Total	88

Figure 1: Logistics Training Institutes supported by PMKK²



Source: NSDC website

These job roles cover entry level to middle level responsibilities (See Appendix A:) for the names of all sub-sectors, job roles and NSQF levels coming under the Logistics sector. A snapshot of all logistics training institutes, and their geographical spread is indicated in Figure 1. As on March 2021, there were 126 registered training centres and 20 training partner institutions spread across India offering skill development for 7 job roles indicating the training capacity developed so far for specific job roles with the support of private sector.

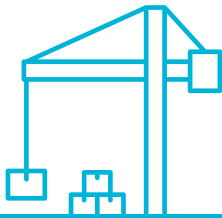
While many more private institutes and PMKKs training candidates for taking up diverse job roles were envisaged to be established in 2019–21 period, the pandemic and its aftermath, have dampened further capacity expansion. However, as life will gradually normalise post-pandemic period, it is expected that many more private training institutes across India will be set up to offer logistics skill training programs to address industry demand through NSDC's support.

² PMKK – Pradhan Mantri Kaushal Kendra or Model Training Centers developed by NSDC.



07

Gaps in India's logistics skill trainings curriculum



To identify skill training gaps and unavailable job roles developed by NSDC, a mapping of career pathways developed by Skills Future (Singapore) was compared with job roles developed by NSDC along 6 common tracks. Singapore's Skills Framework³ is skills training initiative developed for the Singapore workforce to promote skills mastery and lifelong learning and is an integral part of Logistics industry. It is jointly developed by Skills Future Singapore, Workforce Singapore, Singapore Economic Development Board and SPRING Singapore to provide useful information on the sector, career paths, job roles, existing and emerging skills and training programs for skill upgrading and mastery.

One of the key components of Skills Framework are the career pathways that show possible options for vertical and lateral progression for advancement and growth. Under the Logistics framework, Skills Framework Singapore have identified 6 tracks namely,

- ➔ Warehouse Management
- ➔ Transportation Management and Operations
- ➔ Freight Forwarding and Operations

³ [https://www.skillsfuture.gov.sg/skills-framework/logistics#:~:text=Facebookandtext=The%20Skills%20Framework%20\(SF\)%20is,the%20Logistics%20Industry%20Manpower%20Plan. Sourced on 30th April 2021.](https://www.skillsfuture.gov.sg/skills-framework/logistics#:~:text=Facebookandtext=The%20Skills%20Framework%20(SF)%20is,the%20Logistics%20Industry%20Manpower%20Plan. Sourced on 30th April 2021.)

- Sales and Customer Service
- Logistics Solutioning and Programme Management
- Logistics Process Improvement and Information System

Aligned to these six tracks, a total of 57 job roles, critical functions, key tasks and skills and competencies are detailed and available for students and professionals to explore, select and pursue training programs of their interest. The information on career pathways (like shown in Figure 2) provides new entrants and professionals in logistics sector, a career counselling option to explore their career trajectories along the different tracks, choose and register for appropriate training programs to enhance their skills in their chosen track.

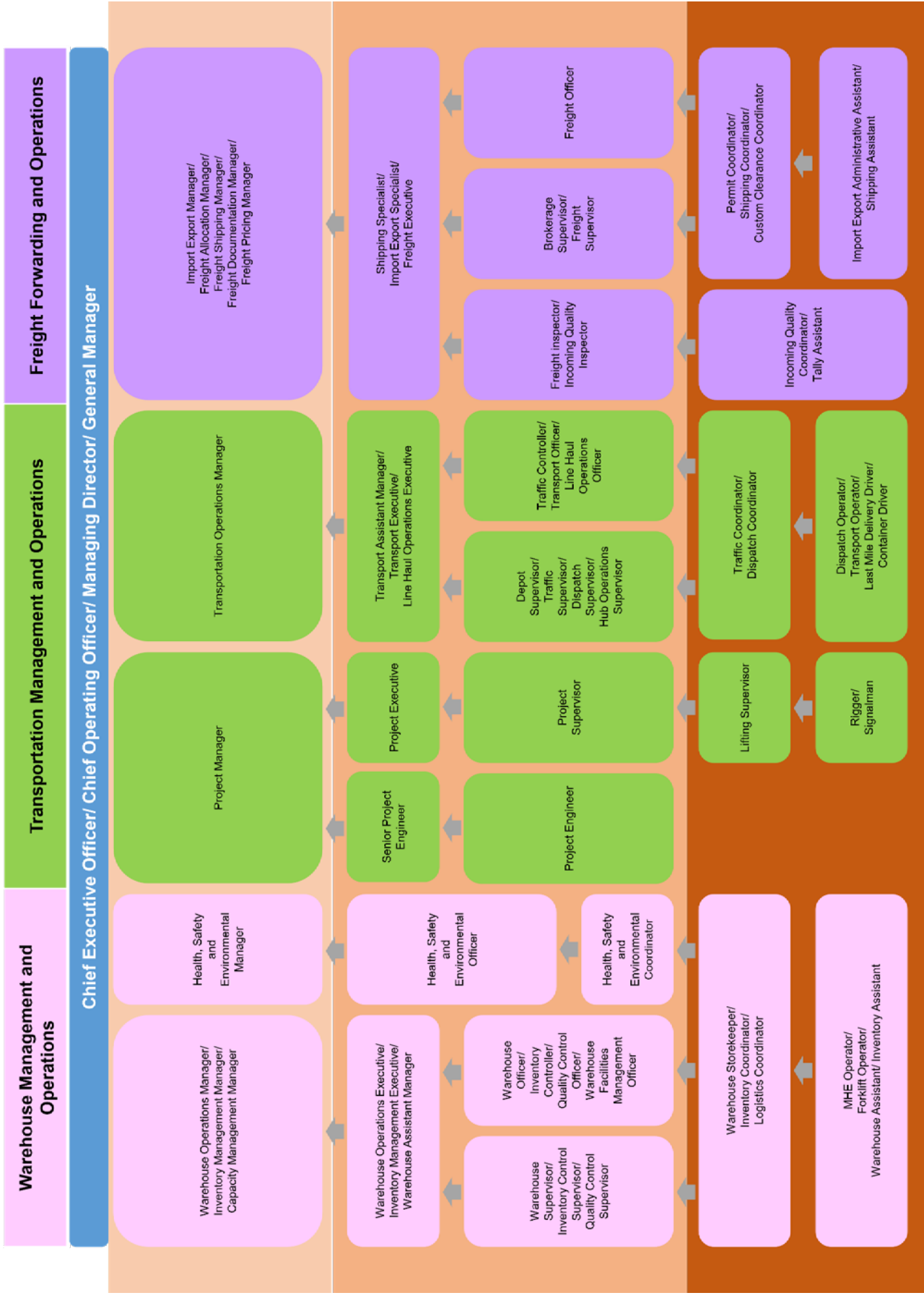
Similar logistics career pathways have not yet been developed by NSDC or LSSC for the Indian logistics sector. If done and publicised well, it will provide an overview of all possible vertical and lateral career progression for advancement and growth in logistics career for aspiring youth of India. If the career pathways are linked with skills and competencies developed by NSDC, it will also indicate which technical skill sets and competencies are required by the aspirant and which institutes across India offer them.

Since career paths for NSDC were not available, the career paths in the Indian setup along the 6 tracks were assumed based upon their QPs and names of respective job role. Figure 3 to Figure 9 in Mapping career paths and job roles of Skills Future and compares NSDC developed tracks vis-à-vis those developed by Skills Future, Singapore. The mapping categorised the job roles into 3 levels – Senior, Middle and Entry levels and compared the job roles at each of these levels between NSDC and Skills Future. From this comparison it was observed that entry level job roles were adequately detailed and covered by NSDC's Logistics Sector Skill Council for the 6 common tracks namely,

1. Warehousing (See Figure 3)
2. Road Freight Transport Management (See Figure 4)



Figure 2: Career paths for Warehousing, Transport Mgmt. and Freight Forwarding



Source: Skill Future, Singapore

3. Freight Forwarding and operations (See Figure 5)
4. E-Commerce (See Figure 6)
5. Cold Chain Logistics (See Figure 6)
6. Port Operations, ICDs, CFSs (See Figure 7)

At the middle and senior level functions, many of the job roles in the 6 tracks were also present, some niche business sectors, new departments and job roles at entry, middle and senior levels in identified tracks were absent and therefore identified for inclusion in NSDC's portfolio of job roles. These have been tabulated in Table 4. From the tracks already developed by NSDC for Logistics, most of the job roles in warehousing, freight forwarding, road freight operations and E-Commerce tracks have been developed for entry level job roles. Very few Middle managerial and senior executive level job roles have been developed in these tracks by NSDC.

Secondly, some tracks and their career paths such as Project Cargo is a niche sub-sector within logistics. It specialises in moving the odd, heavy and wide loads which do not fit into standard logistics solutions. They require different set of equipment, infrastructure and experienced personnel⁴. This segment has emerged as a lucrative business for logistics players in India. Indian ports are also readily adapting to project cargo needs. Presently, skill trainings specific to Project Cargo Logistics are not offered in India and therefore LSSC is encouraged to develop the same.

Thirdly, within the Indian maritime transport domain there are several sub-sectors which offer a range of services to the maritime business. For example, marine services and shipping include brokerage, ship finance, ship repair and construction, ship management, port maintenance and dredging, marine insurance and technical services offer a host of services to the global maritime industry. India is the sixteenth largest maritime country in the world with a coastline of about 7,517 km, 12 major ports and 200 non-major ports. These sub-sectors require adequate, competent and skilled manpower for India. Considering that Indian workforce contributes significantly to the global shipping industry, job roles under the above-mentioned tracks can be generated by providing cutting edge professional training courses developed across all 3 levels.

Another track that LSSC needs to focus is Information Technology (IT) in Logistics. Technology is already transforming the way in which logistics is functioning and has greatly changed this sector in many ways. Digitalisation and new technologies in logistics has enhanced efficiency improvements, customer satisfaction and scaling of services. The extent and use of IT solutions by logistics companies has become a key differentiator for success. Therefore, job roles and training programs for this track, which presently do not exist in LSSC's job roles list, is recommended.

Skills Future have elaborately developed career paths and job roles for these tracks that can be referred for guidance (See Figure 9, Figure 10 and Figure 11 in Appendix B). The specific job roles under marine services that need to be developed by LSSC are mentioned in Table 4. These tracks are an integral part of the maritime transportation sector and can catalyse attracting such businesses and employment generation in the Indian sub-continent.

⁴ <https://cargotalk.in/project-cargo-moving-the-odd-the-heavy-the-wide/> Sourced on 29th April 2021.

Table 4: Relevant sub-sector, tracks and job roles for inclusion by NSDC in Logistics sector

Sub-Sector	Track	Level	Job Roles
Logistics	Warehousing Management (Mgmt.) and Operations	Senior	CEO / Executive, General Manager, HSSE Manager
		Middle	HSSE Officer, HSSE Coordinator
	Road Freight Transport Management and Operations	Senior	CEO / Executive, General Manager, Transport Operations (Ops) Manager
		Middle	Transport Asst. Manager, Depot, Traffic, Hub Ops and Dispatch Supervisor
		Lower	Lifting Supervisor, Traffic Coordinator, Dispatch Coordinator
	Freight Forwarding and Operations	Senior	CEO / Executive, General Manager
		Middle	Quality Control and Brokerage
	Port Operations	Senior	Departmental Heads for Port Engineering, Port Business Pilotage
		Middle	Lead Engineer (Engg.), Business Development, Manager, Operations Supervisor, Harbour Pilot
		Lower	Technicians, Equipment specialists
	Project Cargo Dept.	Senior	Project Mgmt. Manager, Transport Operations Manager
		Middle	Senior Project Engg., Project Engg., Project Executive, Project Supervisor
		Lower	Lifting Superintendent, Rigger / Signal Man
	Cold Chain (CC)	Senior	CEO, General Manager, Cold Storage Manager, Cold Chain Lead
		Middle	Cold Chain Process Manager, Perishable Produce Handling Specialist, Reefer Equipment Maintenance Specialist, CC Engg.
Entry		Reefer Vehicle Operator	
E-Commerce (E-Com)	Senior	CEO, E-Com Website Manager	
	Middle	E-Com Operations Lead, E-Com Website Specialist	
Marine Services	Brokerage	Senior	CEO, Chartering Head, Sales and Purchase Head
		Middle	Chartering Broker, Assistant (Asst.) Chartering Broker, Sales and Purchase (SandP) Broker, Asst. SandP Broker
	Marine Insurance	Senior	CEO, Underwriting Head, Marine Claims Head
		Middle	Marine Underwriter (MU), MU Assistant, Senior (Sr.) Marine Claims Executive, Marine Claims Executive
	Technical Services	Senior	CEO, Principal Marine Consultant, Principal Marine Surveyor, Lean Plan Approval Engineer
		Middle	Marine Consultant, Sr. Marine Surveyor, Sr. Plan Approval Engineer, Plan Approval Engineer

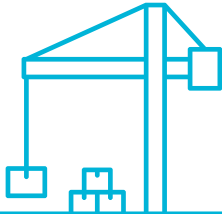
Sub-Sector	Track	Level	Job Roles
Shipping	Ship Management	Senior	CEO, Marine Manager, HSSEQ Manager, Crewing Manager, Technical Manager, Vessel Cost Controller
		Middle	Sr. Marine Superintendent (Suptd.), HSSEQ Suptd. Asst Crew Manager, Sr. Technical Suptd. Vessel Accountant
		Entry	Asst. Marine Suptd. HSSEQ Exec. Crewing Exec. Asst Technical Suptd. Vessel Account Exec.
	Shipping Operations	Senior	CEO, Vessel Operations Head, Vessel Stowage Head, Capacity Mgmt. Head
		Middle	Ship Agency Manager, Port Fixture Manager, Vessel Ops. Manager, Capacity Manager
		Entry	Ship Agent, Port Fixture Exec, Sr. Vessel Operator, Stowage Planner, Capacity Mgmt. Executive, Hub Coordinator
	Commercial Management	Senior	COO, Trade Mgmt. Head, Network Planning Head, Chartering Head
		Middle	Trade Manager, Network Planning Manager, Chartering Manager
		Entry	Trade Mgmt. Exec. Network Planner, Sr. Charterer
IT in Logistics	Logistics Process Improvement and Information Systems (LPI)	Senior	CEO, LPI Manager, Logistics Systems Manager, IT Business Solutions Manager
		Middle	Log. Data Specialist, Biz Process Engg., Operations Integration Engg, IT Biz Solutions Specialist
		Entry	IT Log. Exec, Log. Data Mgmt. Coordinator, Data Entry Coordinator

Source: Adapted from Logistics Skills Future and LSSC

Since last 10-15 years, Logistics and transport industry is confronting immense change with new technology adoption from data analytics, automation to 'physical internet'. With automation the labour needs of a conventional logistics operating model have drastically changed. There are vast opportunities to improve performance, reduce costs and serve customers better with the right investment, clear goals and strategy and business process re-engineering. Demand for a skilled workforce to design, operate and manage logistics business process improvement and information systems integration will be in great demand as most companies will increasingly adopt digitisation to stay ahead of competition. Therefore, job roles under this track have been identified, developed and delivered by training partners under NSDC's monitoring. All the above-mentioned tracks and job roles have been identified in Table 4.

08

Green Logistics Training



There are very few training programs developed for Green Logistics in Universities for students or working professionals. Those available are briefly named and described in this section.

8.1 MIT's Green Supply Chain Management

This is a half semester graduate course in Green Supply Chain Management offered at MIT Boston (Edgar Blanco, Bateman, and Craig 2014) that focuses on the fundamental strategies, tools and techniques required to analyse and design environmentally sustainable supply chains systems. This course is for post graduate engineering and management students in which the topics include Closed-loop supply chains, reverse logistics systems, carbon foot printing, life-cycle analysis, and supply chain sustainability strategy. Class sessions combine presentations, case discussions and guest speakers. All students work on a course-long team project that critically evaluates the environmental supply chain strategy of an industry or a publicly traded company.

8.2 Coventry University's Online Course Module

As part of Coventry University's MSc Global Logistics program, the "Sustainability and Green Logistics: An Introduction" is a 2 weeklong course module in which the main principles of sustainable development in business and green logistics are taught. It is also available as a standalone online course with Future Learn⁵. The course examines the environmental, financial, and social impacts of logistics and procurement operations at a local and global scale, and why these need to be minimised.

⁵ <https://www.classcentral.com/course/sustainability-and-green-logistics-an-introduction-13783> Sourced on 20th April 2021.

Key policies and laws regulating supply chain functions that aim to protect the environment will be introduced along with methods that assess the environmental performance of supply chains, to improve current practices and monitor progress.

This course is suitable for logistics professionals and individuals with an interest in the environmental issues of business supply chain and logistics activities around the globe.

8.3 BMC's Green Logistics Training

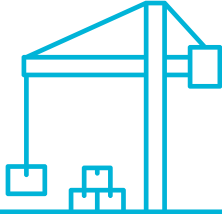
BMC Training and Development, a professional training provider, has a wide array of professional training courses that it offers in the UK, Turkey and Malaysia. This institute has developed a 4 weeklong Green Logistics Training course in Warehouse, Logistics, Supply Chain and Inventory. On completion of the course, participants will be able to:

- Analyse the environmental consequences of logistics and understand how to deal with them.
- Examine ways of reducing the externalities and achieve a more sustainable balance between economic, environmental and social objectives.
- Gain a wide knowledge on green logistics research and discuss its model.
- Determine and assess the external impact of freight transport and measure the environmental impact.
- Discuss the framework for assessing the environmental impact of warehouses and examine ways of reducing the environmental impact.
- Identify and discuss the role of government in promoting green logistics.

The course outline is enclosed in BMC Training Course Outline.

09

Eco-Driving Training



Eco-driving is a style of driving that significantly reduces the impact of diesel on the environment. It does this by reducing fuel consumption and improving the automobile's efficiency. By practicing "Eco-driving", one can be a safer driver, reduce exhaust emissions, save fuel, and save money.

In practice, eco-driving programs vary in terms of scope, delivery methods, curriculum on driving techniques, evaluation metrics and methods, and other supporting elements. As a result, there is no standard definition of an eco-driving program. Eco-driving does not happen only during vehicle operation. It includes pre- and post-driving activities like route planning, vehicle inspection, and maintenance. These techniques allow drivers and fleet managers to understand what factors impact a truck's fuel consumption and provide them with recommendations on how to operate more efficiently. Other terms for eco-driving techniques are "soft driving," which usually refers to fuel-saving practices, and "smart driving," which incorporates not just fuel-efficient manoeuvres but also safety behaviours like defensive driving. Some tips to drivers for eco-driving are as follows⁶:

- Accelerate and decelerate smoothly.
- Avoid excess idling in non-traffic situations.
- Observe the posted speed limits.
- Keep tyres properly inflated to the recommended pressure.
- Maintain a steady speed.
- Air conditioning should be used selectively as to reduce the load on your engine. Remove excess weight.
- Plan and consolidate your trips.

⁶ https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm9_006720.pdf sourced on 29th April 2021.

- Share a ride and/or carpool.
- Avoid “topping-off” the gas tank when refuelling.
- Today’s engines do not need to be warmed up in the winter. Prolonged idling creates excess emissions and wastes fuel.

A literature review of eco-driving pilot programs and studies (Pineda and Xie 2021) found that fuel savings for truck fleets can range from 3.5 per cent to 30 per cent. This wide variance in results can be explained by differences in driver experiences and profiles, data collection, monitoring and reporting methods, choice of metrics and goals, time frame of studies, and baseline measurements.

Table 5: Eco-driving training methods and impact on fuel economy

Location	Training Method	Evaluation setting	No. of drivers	Fuel economy improvement
UK	Driving Simulator	Driving Simulator	>600	3.5%
USA	Coaching and in-vehicle feedback	Real world routes	695	13%
Australia	Classes	Prescribed real world route	12	27%
Europe	Classes with monthly feedback and refresher courses	Real world routes	322	9%
Japan	Classes	No information	3000	8%

Source: (Pineda and Xie 2021)

Studies from other countries have demonstrated that a combination of driver training and driver monitoring can benefit carriers by 10 per cent fuel efficiency increase. A variety of training techniques including classroom, online in-cab and driving, simulator-based programs are available. Several studies compiled by the American Transportation Research Institute⁷ indicate that training is not a “one-size-fits-all” solution therefore by offering a variety of training options to their drivers such as online and in-cab training, driver management systems, driver monitoring, and in-person coaching driver behaviour can be directed towards eco-driving.

For online training, Schneider National has enrolled their drivers in a fuel management course which offers training on a variety of skills and techniques such as idling, progressive shifting and situational driving.

The IRU Academy has an eco-driving training (See Factsheet⁸) which supports key initiatives and regulations on safety, the environment and resource efficiency. This course is for all commercial drivers at all levels of experience and is offered globally through the IRU Academy network of Associate Training Institute. The participants learn:

- How to be a proactive driver and anticipate what is ahead?
- Fuel efficiency driving techniques.
- Advanced vehicle optimisation
- Staying safe on the road using the latest technology

⁷ <https://truckingresearch.org/sustainable-driving-practices/#DriverTrainingIncentives> sourced on 29th April 2021.

⁸ <https://www.iru.org/system/files/IRU%20Academy%20FS%20ECO%20Driving%20EN.pdf> sourced on 29th April 2021.

The ECO-Driving course, taken in one day, is ideally followed by a period of driver performance monitoring using the web-based ECO-Driving Training System. This allows driver behaviour to be measured objectively and its impact on fuel consumption analysed. Participants receive the ECO-Driving certificate when they have completed the course.

9.1 Smart Truck Fleet Management

Smart Freight Centre developed a Smart Truck Fleet Management framework and Smart Transport Manager Training program (Punte et al. 2017) to train operational training managers for fleet energy management globally. Their training program emphasizes a holistic and locally adaptable approach to energy management of truck fleets consisting of five pillars:

- Fuel management.
- Driver and staff skills development.
- Vehicles and maintenance.
- Performance monitoring.
- Utilizing information technology.

In practice, the capacity of a Smart Transport Manager to develop an action plan, knowledge products, and a community of Smart Transport Managers together with shippers as their customers, suppliers and other stakeholders they interact with will determine the success of sustainable and environmentally friendly truck fleet management. Trained and upskilled transport managers make better decisions on technology and best practice interventions. Freight operators that employ them benefit from more efficient fleets and reduced operating cost and emissions. They are likely to be preferred by leading shippers and logistics service providers that care about mitigating the climate impacts from freight.

The course equips Transport managers to become elite professionals on the five pillars of efficient truck fleet management. The course trains each participant to develop an action plan specific to the truck fleet he/she manages. An SFC specialist reviews and approves the Action Plan and prepares a supporting 'road map' to give feedback to encourage implementation of the Action Plan prepared by the participant. A Smart Transport Manager certificate is issued and the participant is admitted to the community of Smart Transport Managers.

To enable global applicability/comparability the course was developed at the European Qualifications Framework (EQF) level 4. Core training materials include a training remit, trainer guide, slide pack, case studies and an Action Plan template. The core course can be adapted to different markets by including local examples, suppliers and relevant policies.

Smart Truck Fleet Management can be introduced in India or India's road freight market in three ways: training course, knowledge products, and building a community of Smart Transport Managers together with their customers and partners. Introducing the training in a specific market requires local partnering, content relevance review, localizing, piloting, revising and roll-out.

The training course may be sponsored or supported by stakeholders of transport operators, such as multinationals as customers of freight transportation, an industry association, or development agency.

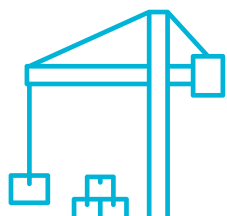
9.2 Eco-Driving Programme of Green Freight Asia

Green Freight Asia (GFA) is a non-profit association of industry players, which collaborate with companies, NGOs and governments to improve the energy efficiency, fuel efficiency, reduce GHG emissions and lower operational costs across the supply chain. They help organisations optimize their operations for better efficiency through 6 different programs – Measurement, Reporting and Verification, Partnership Impact, Labelling and Certification, Carbon Offsetting, Eco-driving and Annual Award Program

In line with the global sustainable transport, Green Freight Asia is working together with certified eco-driving partners to offer training and guidance to road transportation companies in Asia on application of smart technologies. Their eco-driving training platform demonstrates how much energy the companies can save by driving in an environmentally conscious manner and save millions of tons of GHG gases. Their training is divided into 2 modules – Train the Trainer and Train the Driver. The latter focuses on building drivers' skills to achieve carbon reduction in their fleet. A data set is analysed to understand how much GHG emissions a specific fleet size emits and how much of it belong to scope 1 and 3 emissions.

10

Cold Chain Logistics



With a surge of COVID cases in 2021, India's vaccine logistics has been foremost in the minds of Indian policymakers in India. Since vaccine logistics require efficient cold chains, a review of specialised trainings for cold chain logistics was also conducted. Cold Chain Logistics is the technology and process that allows for the safe transport of temperature sensitive goods and products along the supply chain. It relies heavily on science to evaluate and accommodate for the link between temperature and perishability. Any product known to be or labelled as "perishable" will likely need cold chain management and logistics. This could include foods like meat and seafood, farm produce – fresh and processed, medical supplies and pharmaceuticals, dairy, etc. Technologies in cold chain are available across multiple dimensions depending on the place and purpose of use. For example, packhouse technology in farms, chillers for dairy and fisheries sector, reefer chambers and containers during transportation, ripening chambers and refrigeration plants at warehouses.

Similarly, to design, fund, manage and operate these multiple dimensions of cold chain technologies a diverse set of stakeholders are required and need to be trained. For start-ups and Entrepreneurs to design and implement profitable business models in cold chain solutions. Cold storage owners, plant heads and end users to be apprised of cold chain technologies and maintenance routines that increase efficiency and performance. And entry level technicians and executives that seek a deeper knowledge of the science and technology of cold chain logistics. While there are some entry level job profiles already developed by NSDC, they fall short of middle and senior job profiles in this track. The latter have been identified in Table 4.

In India, the National Institute of Food Technology, Entrepreneurship and Management (NIFTEM) covers a post graduate MTech. program – Food Supply Chain Management⁹ in which Food Cold Chain Management constitutes one of the core courses in that program.

9 http://niftem.ac.in/newsite/?page_id=314 Sourced on 29th April 2021.

The Institute of Good Manufacturing Practices India (IGMPI) is an FSSAI approved training institute that is offering an Executive Diploma in Food Supply Chain Management which covers Cold Chain Management as one of their training modules in their program¹⁰. In the private sector, DANFOSS India, a market leader in air conditioning and cooling systems hosts a learning platform that offers hundreds of training courses available on latest industry trends, regulations, installation of their all their products, skills training on operations and maintenance of cooling and refrigeration machinery. The details of courses and curriculum are available on their website¹¹.

Internationally, the leading universities offering cold chain related modules are Wageningen University and UC Davis. Wageningen University covers cold chain logistics modularly in their different course offerings.

Professional Training	Executive Program	Food Cold Chain Course
Graduate Programs	BSc Minors	BSc in Agriculture Business Management
		BSc in Animal Sciences
BSc in Food Technology		
	Bachelors Program	BTech. in Food Technology
Post Graduate Programs	Master Program	MSc in Aquaculture and Marine Resource
		MSc in Food Quality Management
		MTech. in Food Technology
PhD Programs	Research Projects	Preservation techniques and food quality
		Nutrition and Health
		From hunger to food security

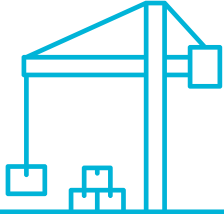
The details of these course offerings and the topics covered are available on their website at <https://bit.ly/3uA0vE6>

10 <https://www.igmpiindia.org/executive-diploma-food-supply-chain-management.html#>
Sourced on 29th April 2021.

11 https://danfoss.sabacloud.com/Saba/Web_spf/EU2PRD0064/guest/guestlearningcatalog
Sourced on 29th April 2021.

11

Summary and Conclusions



Based on Indian logistics industry requirements, this report aimed to identify potential training topics that were not already offered by the established Indian universities, institutes or training centres. It also compiled training material and module links from reputed institutions on climate friendly logistics. In doing so, the report reviewed KPMG's findings to assess skill gaps and training needs in India's logistics sector. The KPMG's report observed that skilled workforce is hugely in demand for supply chain Consulting, Custom Clearances, Courier services, Logistics – Project, Cold Chain, Contract, Reverse, Express and Freight Forwarding activities in India for entry, middle and senior level roles. The World Bank's Logistics Performance Index published in 2018 reinforced India's logistics skill gap challenges and advised the country's skill development system to cope with rapid changes brought about through technology and digitalisation. This report highlighted the 3 main strategies adopted by Germany, Netherlands and Singapore to effectively address these skill development challenges, namely.

- Devising a systematic policy, program and action plan for building skills
- Re-design of training courses around technology adoption in logistics
- Multi-stakeholder collaboration to ensure industry relevance of skill development curricula and courses.

This report further listed the existing public and private institutes conducting formal logistics courses and highlighted the inadequacy in terms of course coverage and scale required to skill Indian workforce for logistics market. It also noted the efforts by CII's Institute of Logistics to develop and sustain multi-stakeholder collaborations between academia, research institutes and industry and has drawn parallels with Germany's skill development program. The report also reviewed the role of NSDC and Logistics Sector Skill Council for developing skill development curriculum, creating adequate training capacity and promoting this sector as an exciting career option to the youth of India. LSSC has already developed 88 job roles across the 10 different logistics sub-sectors. As of

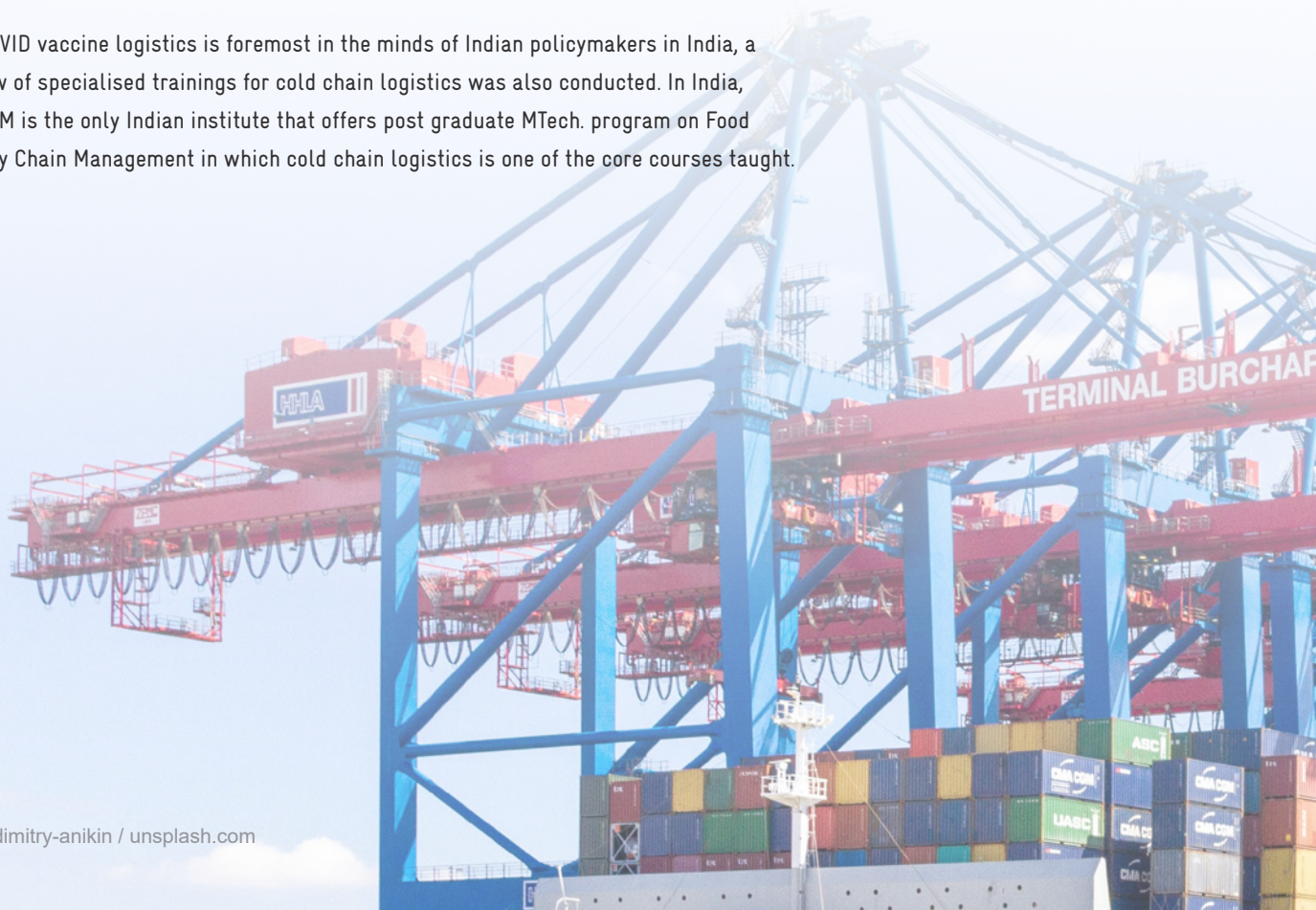
March 2021, 126 registered training centres and 20 training partner institutions were active in disseminating relevant training courses specific to logistics.

To identify skill training gaps in India, LSSC identified job roles were benchmarked with the job roles developed by Skills Future, Singapore across 6 logistics sub-sectors (also called tracks). From this comparison, it was evident that job roles for warehousing, road freight transport management, freight forwarding and e-commerce were adequately developed by LSSC for entry level jobs. However middle and senior level job roles in the 6 logistics sub-sectors were not available in India. Secondly, some tracks and their career paths, specifically in Project Cargo, some marine services and shipping were not available in India even though India is a prominent maritime state in the world. IT in Logistics was another important track whose career paths, job roles and training programs will need to be developed on priority as they will be in great demand in the years to come.

From a literature review and internet search, very few institutes worldwide are offering trainings on green logistics. Notable amongst those available is from MIT, Boston which offers a graduate course on Green Supply Chain Management for half a semester. Coventry University together with Future Learn offers an online 2 week-long course module titled an introductory course on Sustainability and Green Logistics. Amongst private training institutes, BMC Training, offers a 4 weeklong Green Logistics Training Course in Warehouse, Logistics, Supply Chain and Inventory. Presently, there are no courses or trainings available on green logistics in India.

One of the green freight measures is Eco-driving which when implemented pan India will reduce fuel consumption in road freight transport and improve automobile efficiency thereby reduce carbon emissions. UK, USA, Australia, Europe and Japan have offered several Eco-driving training programs using different training techniques. IRU Academy, ECO-Driving, Schneider, Smart Freight Centre and Green Freight Asia have developed eco-driving training programs for drivers, trainers and transport managers to achieve carbon reduction on a country wide scale.

As COVID vaccine logistics is foremost in the minds of Indian policymakers in India, a review of specialised trainings for cold chain logistics was also conducted. In India, NIFTEM is the only Indian institute that offers post graduate MTech. program on Food Supply Chain Management in which cold chain logistics is one of the core courses taught.



NIFTEM is collaborating with DANFOSS to offer executive courses on Cold Chain customised for different sets of stakeholders. Besides, DANFOSS also offers online technical trainings for operating and maintaining cooling systems and technologies employed by their company.

In conclusion, India's logistics sector is in for a major transformation with technological adoption along with exponential growth triggered by a host of drivers including country's economic and industrial growth, customer demand, etc. To drive sustainable logistics, the availability of highly skilled and technologically competent workforce is essential. While huge efforts, industry focus in logistics curriculum development for specific job roles have been institutionalised by NSDC and CII-IL. However, there is scope for making the sector attractive for aspiring youth. Towards this it is recommended to develop detailed career paths for each logistics sub-sector and link the offered skill development courses and trainings so that new entrants and working professionals can aspire to progress in their careers by subscribing to appropriate skill trainings. Secondly, it is recommended to develop required qualification packs for middle and senior level job roles that are presently missing in those developed by LSSC so far. Career paths and job roles in some logistics sub-sectors (e.g., Project Cargo, Marine Services, Information Technology in Logistics and Shipping) also need to be developed by LSSC. These are listed in Table 4.

It is equally important to develop green logistics and eco-driving training programs and course modules in Indian Universities, Institutes and NSDC supported training centres for students, working professionals and senior executives in logistics industry. This will inspire them to adopt viable climate friendly solutions towards safeguarding the environment from air pollution, product wastage and fossil fuel consumption as well as enhance their operational efficiencies creating a win-win for all stakeholders.





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Annexures

A. List of logistics job roles by different Sector Skill Councils

Sector	Sub-sectors	Job Roles	NSQF Levels
Logistics	Air Cargo Operations	Ground Operations Associate	4
Logistics	Air Cargo Operations	Pallet Maker	2
Logistics	Air Cargo Operations	Ramp Operation Associate	4
Logistics	Cold Chain Solutions	Cold Chain Manager-LSC/Q8702	7
Logistics	Cold Chain Solutions	Cold Chain Engineering Specialist-LSC/Q9201	6
Logistics	Cold Chain Solutions	Perishable Product Handling Specialist-LSC/Q8701	5
Logistics	Cold Chain Solutions	Cold Chain Process Management Specialist-LSC/Q8601	5
Logistics	Cold Chain Solutions	Refrigeration Equipment Maintenance Specialist-LSC/Q9101	5
Logistics	Cold Chain Solutions	Reefer Vehicle Operator-LSC/Q8901	4
Logistics	Courier and Mail Services	Courier Delivery Executive	3
Logistics	Courier and Mail Services	Courier Pick-up Executive	3
Logistics	Courier and Mail Services	Mail Handler	2
Logistics	Courier and Mail Services	Courier Sorter	3
Logistics	Courier and Mail Services	Shipment Bagging Agent	3
Logistics	Courier and Mail Services	Lead Courier	5
Logistics	Courier and Mail Services	Shipment Classification Agent	4
Logistics	Courier and Mail Services	Clearance Support Agent	4
Logistics	Courier and Mail Services	Shipment Query Handler	4
Logistics	Courier and Mail Services	Delivery Management Cell Agent	4
Logistics	Courier and Mail Services	Courier Branch Sales Executive	4
Logistics	Courier and Mail Services	Courier Institutional Sales Executive	4
Logistics	Courier and Mail Services	Key Consignor Executive	5
Logistics	Courier and Mail Services	Courier Claims Processor	5
Logistics	Courier and Mail Services	Courier Manager-LSC/Q1904	6
Logistics	Courier and Mail Services	Courier Supervisor-LSC/Q1903	5
Logistics	Courier and Mail Services	Courier Executive-LSC/Q1902	4
Logistics	Courier and Mail Services	Courier Associate-LSC/Q1901	3
Logistics	E-Commerce	E-commerce Team Lead-LSC/Q2601	5
Logistics	E-Commerce	E-commerce Manager-LSC/Q2602	6
Logistics	EXIM Logistics, Freight Forwarding and Customs Clearance	Customs Clearance - Documentation Executive - Export	4
Logistics	EXIM Logistics, Freight Forwarding and Customs Clearance	Customs Clearance - Documentation Executive - Import	4
Logistics	EXIM Logistics, Freight Forwarding and Customs Clearance	Customs Clearance - Field Operation Executive - Export	4
Logistics	EXIM Logistics, Freight Forwarding and Customs Clearance	Customs Clearance - Field Operation Executive - Import	4

Sector	Sub-sectors	Job Roles	NSQF Levels
Logistics	EXIM Logistics, Freight Forwarding and Customs Clearance	Freight Forwarding - Documentation Executive - Export	4
Logistics	EXIM Logistics, Freight Forwarding and Customs Clearance	Freight Forwarding - Documentation Executive - Import	4
Logistics	EXIM Logistics, Freight Forwarding and Customs Clearance	EXIM - Executive-LSC/Q2101	4
Logistics	EXIM Logistics, Freight Forwarding and Customs Clearance	EXIM - Manager-LSC/Q2103	6
Logistics	EXIM Logistics, Freight Forwarding and Customs Clearance	EXIM - Supervisor-LSC/Q2104	5
Logistics	Inland Waterways and Marine Services	Vessel Operator Grade 1-LSC/Q4101	3
Logistics	Inland Waterways and Marine Services	Vessel Operator Grade 2-LSC/Q4102	4
Logistics	Inland Waterways and Marine Services	Vessel Operator Grade 3-LSC/Q4103	5
Logistics	Land Transportation	Commercial Vehicle Driver	4
Logistics	Land Transportation	Loader/Unloader	2
Logistics	Land Transportation	Transport Coordinator	4
Logistics	Land Transportation	Transport Consolidator	4
Logistics	Land Transportation	Consignment Booking Assistant	3
Logistics	Land Transportation	Consignment Tracking Executive	3
Logistics	Land Transportation	Documentation Assistant	4
Logistics	Land Transportation	Transport Manager-LSC/Q1004	6
Logistics	Land Transportation	Land Transportation Supervisor-LSC/Q1003	5
Logistics	Land Transportation	Land Transportation - Executive-LSC/Q1002	4
Logistics	Land Transportation	Land Transportation - Associate-LSC/Q1001	3
Logistics	Liquid / Fluid Logistics	Tank Farm Associate-LSC/Q3511	3
Logistics	Liquid / Fluid Logistics	Tank Farm Supervisor-LSC/Q3512	5
Logistics	Liquid / Fluid Logistics	Tank Farm Manager-LSC/Q3513	6
Logistics	Liquid / Fluid Logistics	Liquid Transport Operator-LSC/Q4301	4
Logistics	Port Terminals, ICD and CFS	Ship and yard planning supervisor-LSC/Q3501	5
Logistics	Port Terminals, ICD and CFS	CFS and ICD supervisor-LSC/Q3502	5
Logistics	Port Terminals, ICD and CFS	Cargo handler- manual-LSC/Q3601	4
Logistics	Port Terminals, ICD and CFS	Cargo equipment handler-LSC/Q3701	4
Logistics	Port Terminals, ICD and CFS	Cargo Surveyor-LSC/Q3801	4
Logistics	Terminals, ICDs and CFS Operations	Cargo Surveyor	4
Logistics	Terminals, ICDs and CFS Operations	Grab Ship Unloader Crane Operator	4
Logistics	Terminals, ICDs and CFS Operations	Rail Mounted Quay Crane operator	4
Logistics	Terminals, ICDs and CFS Operations	Signalman	3
Logistics	Terminals, ICDs and CFS Operations	Stevedoring Labour	2
Logistics	Warehouse - Storage and Packing	Forklift Operator	4
Logistics	Warehouse - Storage and Packing	Warehouse Picker	3
Logistics	Warehouse - Storage and Packing	Warehouse Packer	3
Logistics	Warehouse - Storage and Packing	Warehouse - Kitting / Labeller	2

Sector	Sub-sectors	Job Roles	NSQF Levels
Logistics	Warehouse – Storage and Packing	Warehouse Binner	3
Logistics	Warehouse – Storage and Packing	Data Feeder – Warehouse	3
Logistics	Warehouse – Storage and Packing	Warehouse Supervisor	5
Logistics	Warehouse – Storage and Packing	Inventory Clerk	3
Logistics	Warehouse – Storage and Packing	Reach Truck Operator	4
Logistics	Warehouse – Storage and Packing	Receiving Assistant	3
Logistics	Warehouse – Storage and Packing	Warehouse Quality Checker	3
Logistics	Warehouse – Storage and Packing	Loading Supervisor	3
Logistics	Warehouse – Storage and Packing	MHE Maintenance Technician	4
Logistics	Warehouse – Storage and Packing	Goods Packaging Machine Operator	4
Logistics	Warehouse – Storage and Packing	Warehouse Claims Coordinator	4
Logistics	Warehouse – Storage and Packing	Warehouse Associate-LSC/Q0101	3
Logistics	Warehouse – Storage and Packing	Warehouse Supervisor-LSC/Q0102	5
Logistics	Warehouse – Storage and Packing	Warehouse Manager-LSC/Q0103	6
Logistics	Warehouse – Storage and Packing	Inventory, Materials Manager-LSC/Q0104	6
Logistics	Warehouse – Storage and Packing	Warehouse, Inventory and Transport Manager-LSC/Q0105	6
Logistics	Warehouse – Storage and Packing	Warehouse Executive-LSC/Q0301	4
Logistics	Warehouse – Storage and Packing	Material Handling Operator and Technician-LSC/Q0401	4
Aerospace and Aviation	Airline	Airline High Lift Truck Operator	3
Aerospace and Aviation	Airline	Airline Cargo Assistant	3
Aerospace and Aviation	Airline	Airline Baggage Handler	3
Aerospace and Aviation	Airline	Airline Customer Service Executive	4
Aerospace and Aviation	Airline	Flight Dispatcher	5
Aerospace and Aviation	Airline	Airline flight load controller	5
Aerospace and Aviation	Airline	Airline Reservation Agent	4
Aerospace and Aviation	Airline	Airline First Officer	6
Aerospace and Aviation	Airline	Airline Network Planning Analyst	4
Aerospace and Aviation	Airline	Airline Pushback Operator	4
Aerospace and Aviation	Airline	Other Equipment Operator	4
Aerospace and Aviation	Airline	Airline Forklift Operator	4
Aerospace and Aviation	Airport	Airport Warehouse Coordinator	4
Aerospace and Aviation	Airport	Airport Cargo Operations Assistant	3

Sector	Sub-sectors	Job Roles	NSQF Levels
Aerospace and Aviation	Airport	Airport Cargo Assistant	3
Automotive	Road Transportation	2W- Delivery Associate	3
Automotive	Road Transportation	Ambulance Driver	4
Automotive	Road Transportation	Auto Rickshaw Driver	4
Automotive	Road Transportation	CHAUFFEUR L4	4
Automotive	Road Transportation	CHAUFFEUR L5	5
Automotive	Road Transportation	Commercial Vehicle Driver Level 4	4
Automotive	Road Transportation	Driving Assistant	2
Automotive	Road Transportation	Forklift Operator (Driver)	4
Automotive	Road Transportation	Highway Toll Attendant	3
Automotive	Road Transportation	Highway Toll Collector	4
Automotive	Road Transportation	Highway Toll Traffic Channelizer	2
Automotive	Road Transportation	Light motor Vehicle Driver Level 3	3
Automotive	Supply Chain Management	Loading and Unloading Operator/ Loader	2
Automotive	Supply Chain Management	Manager Vendor Development	6
Automotive	Supply Chain Management	Manager-Stores Operation	5
Automotive	Supply Chain Management	Material Coordination Manager	6
Automotive	Supply Chain Management	Packing Executive/Packing Assistant/Packer	2
Automotive	Supply Chain Management	Parts Picker	3
Automotive	Road Transportation	Taxi Driver	4
Automotive	Road Transportation	Vehicle Driver Trainer	5
Automotive	Supply Chain Management	Vendor Development Executive	5
Agriculture	Agriculture Industries	CA Store Technician/Operator	5
Agriculture	Agriculture Industries	Cold Storage Manager	7
Agriculture	Agriculture Industries	Cold Storage Supervisor	5
Agriculture	Agriculture Industries	Cold storekeeper	5
Agriculture	Agriculture Industries	Packhouse Worker	3
Agriculture	Agriculture Industries	Ripening Chamber Operator	4
Agriculture	Agriculture Industries	Supply Chain Field Assistant	4
Agriculture	Agriculture Industries	Warehouse Worker	3
Agriculture	Agriculture Industries	Agri Warehouse Supervisor	5

B. Mapping career paths and job roles of Skills Future and LSSC

Figure 3: Warehousing related job role comparison between LSSC and Skill Future

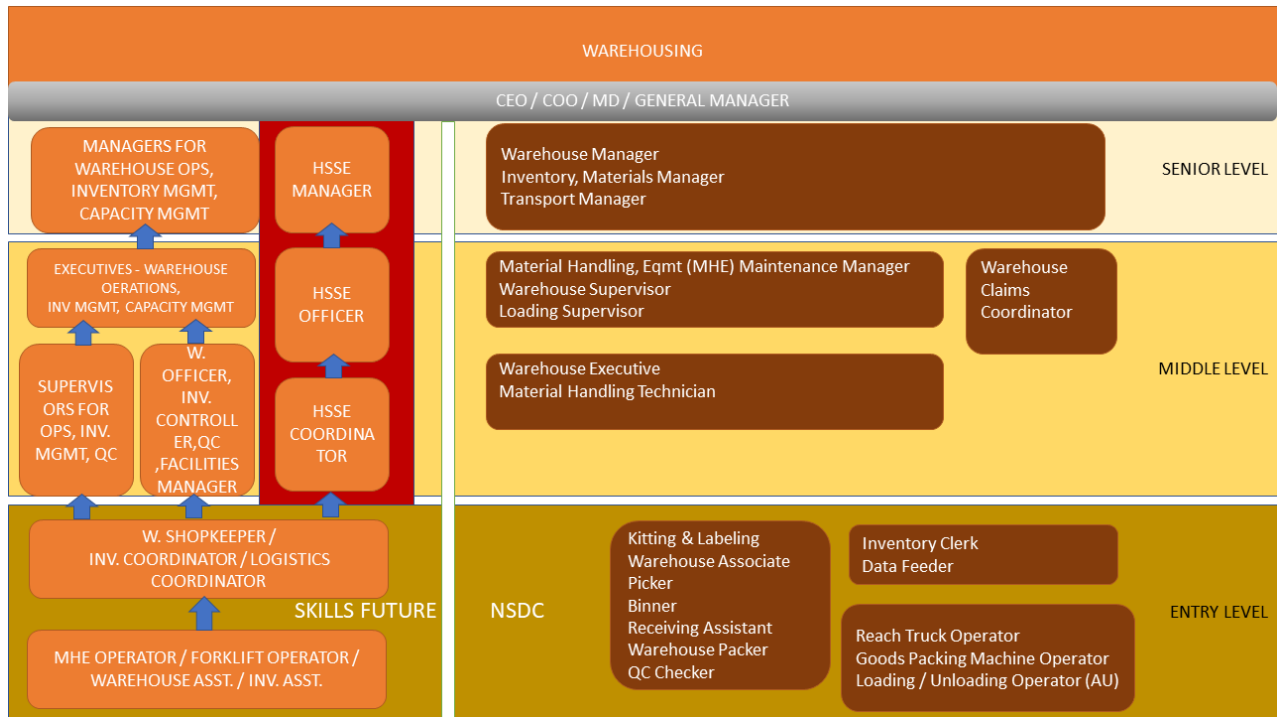


Figure 4: Road Transport's job role comparison between LSSC and Skill Future

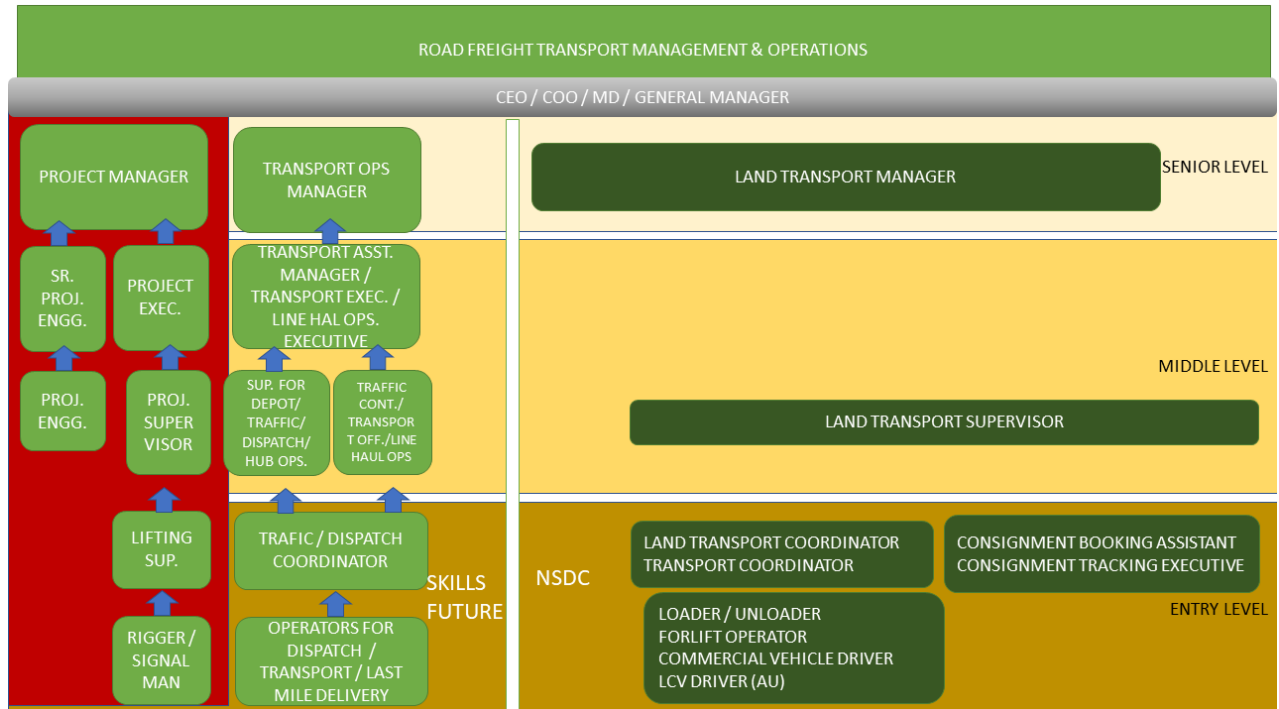


Figure 5: Freight Forwarding's job role comparison between LSSC and Skill Future

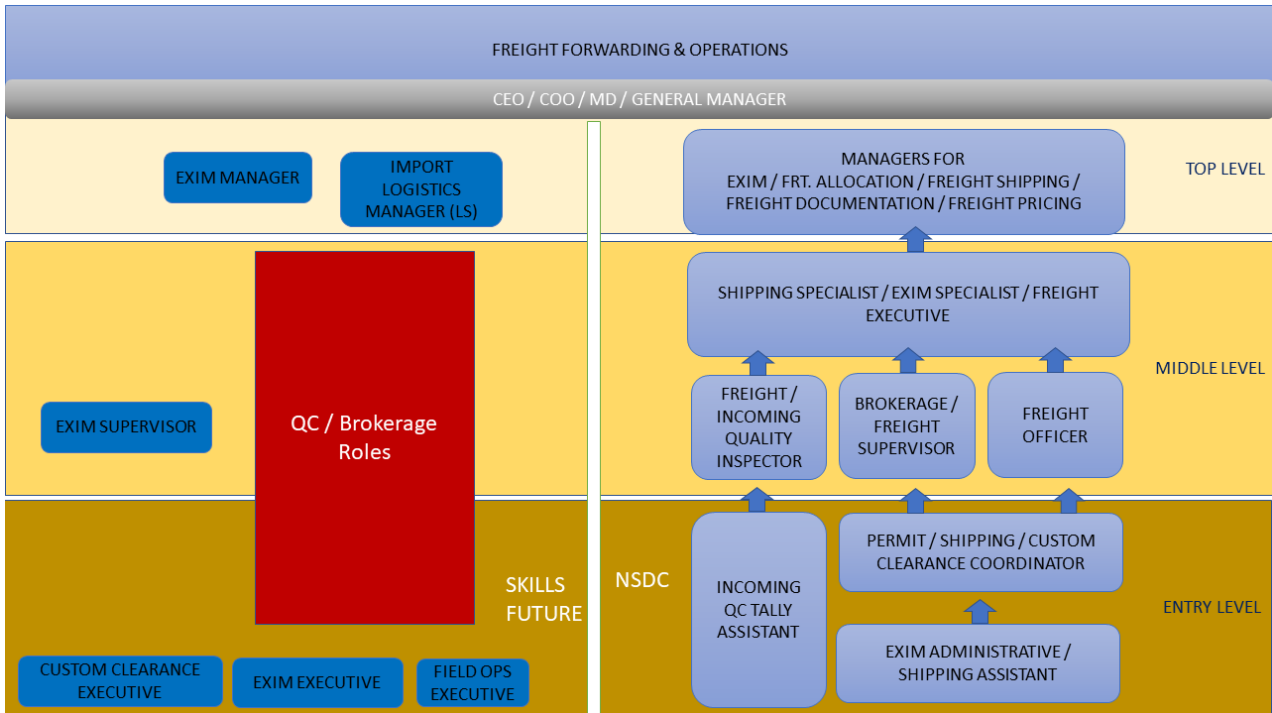


Figure 6: Courier, Cold Chain and E-Commerce - job role comparisons

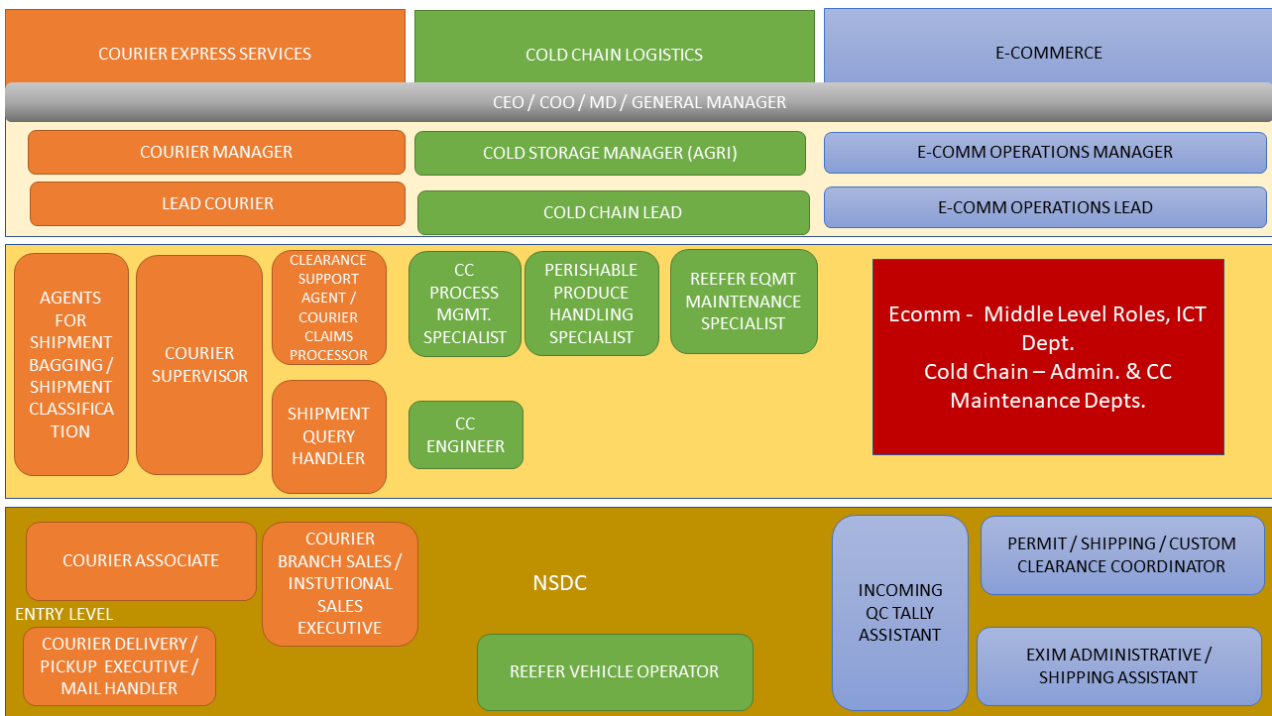


Figure 7: Port Operations job role comparison between LSSC and Skill Future

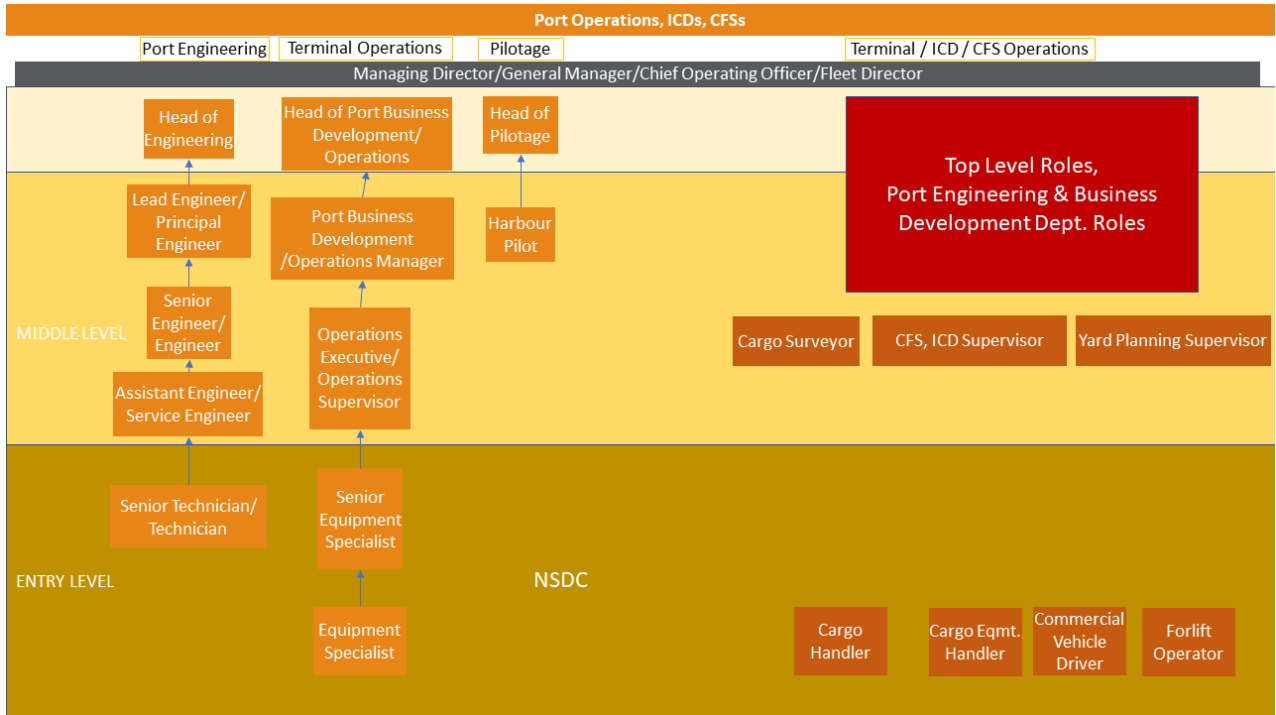


Figure 8: Project Cargo - job role comparison between LSSC and Skill Future

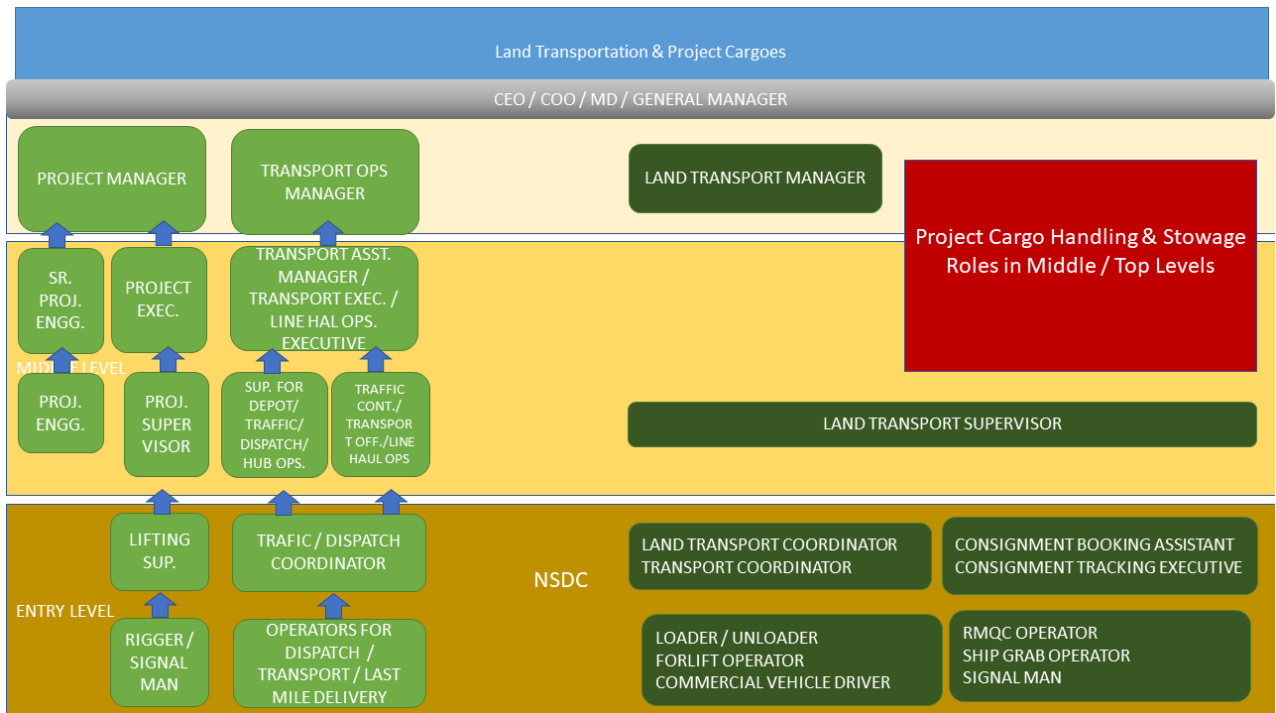


Figure 9: Maritime Service and Shipping - job role comparison

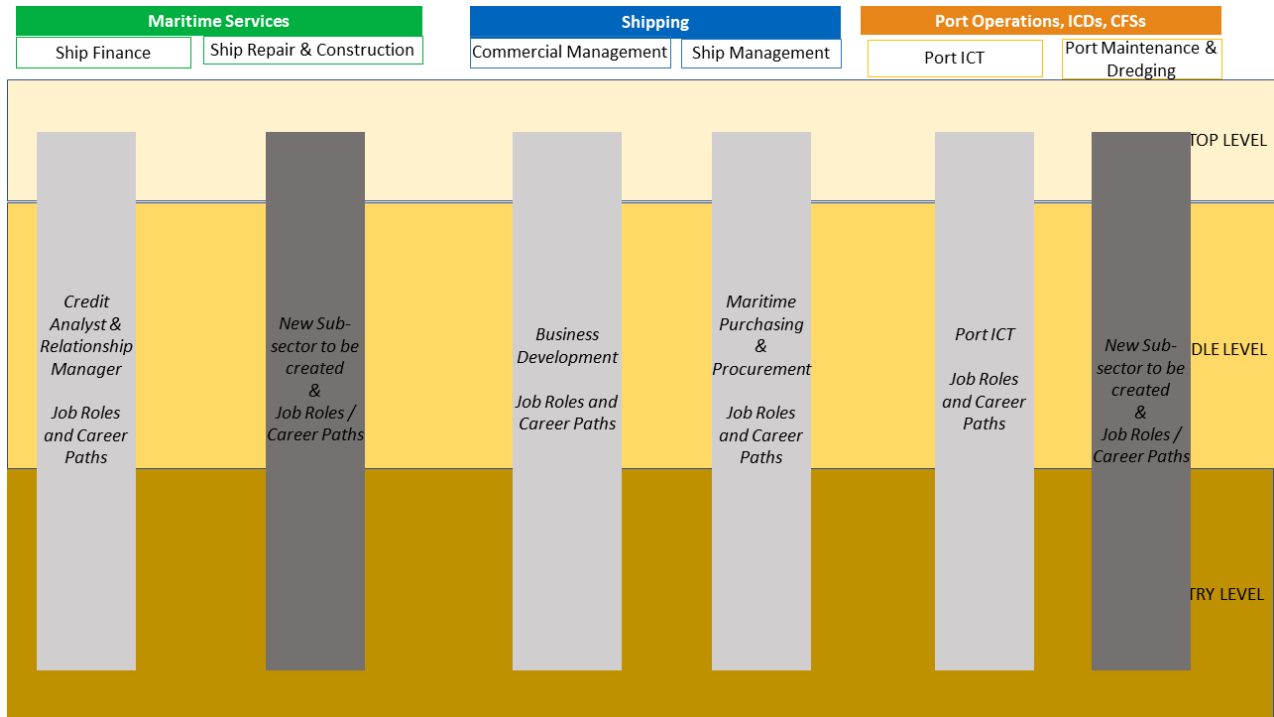


Figure 10: Brokerage, Marine Insurance and Technical Service career pathways

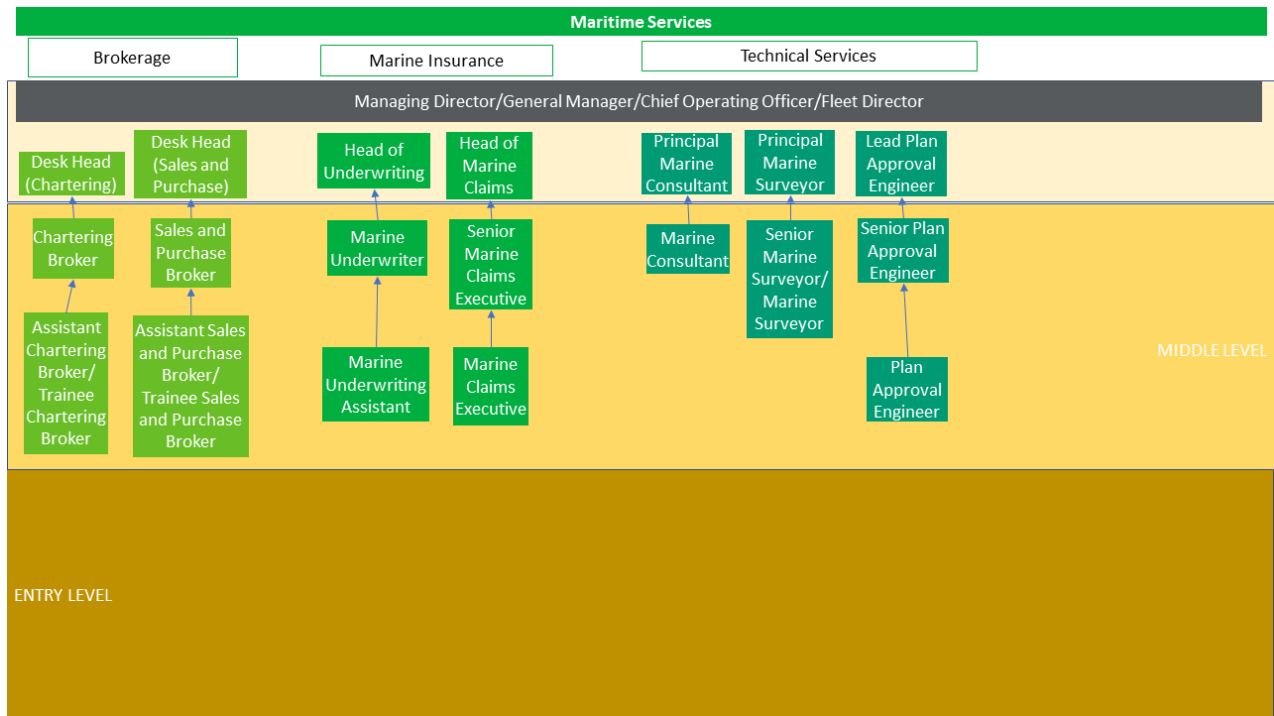
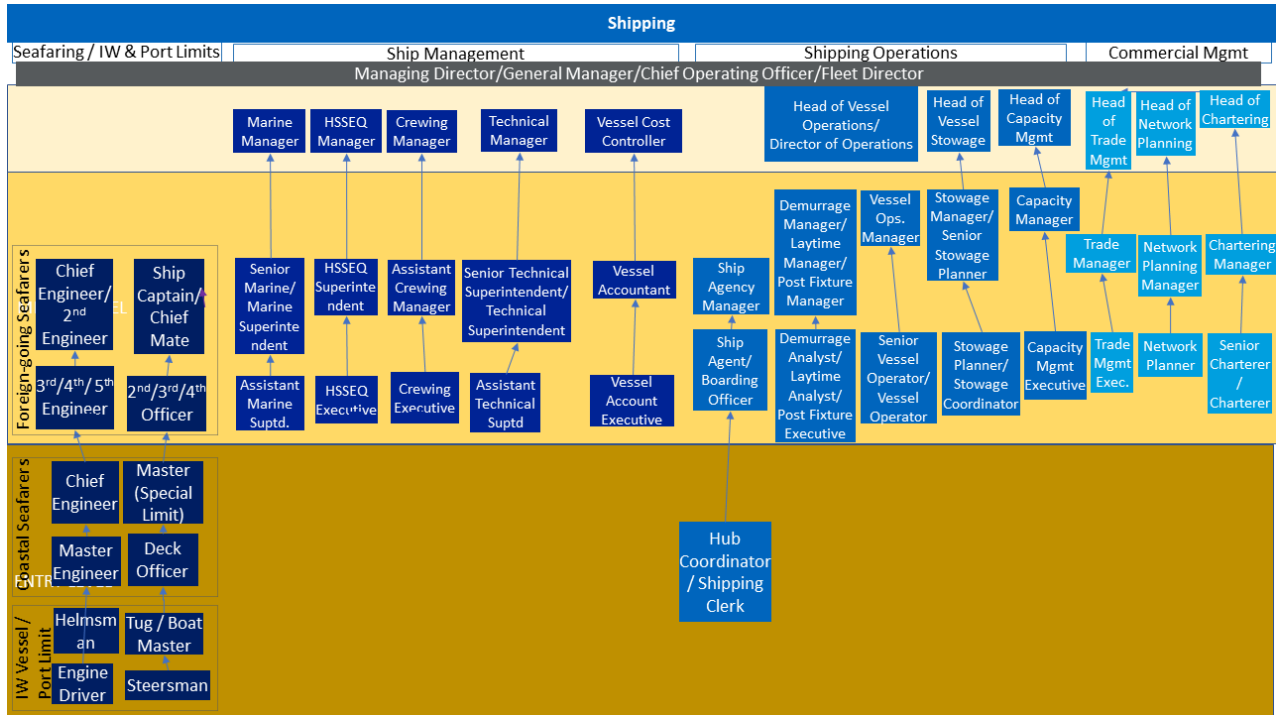


Figure 11: Shipping related career pathways



C. BMC Training Course Outline

Module 1: Assessing the Environmental Effects of Logistics

Environmental Sustainability: A New Priority for Logistics Managers

- A brief history of green logistics research
- Green logistics: rhetoric and reality
- Future scenarios
- A model for green logistics research

Assessing the External Impacts of Freight Transport

- External impacts
- Environmental standards
- Measuring the environmental impact of freight transport

Carbon Auditing of Companies, Supply Chains and Products

- Guidelines for carbon foot printing
- The carbon foot printing process
- Success factors in carbon foot printing

Case Study: Carbon Auditing of Road Freight Transport Operations in the UK

Evaluating and Internalizing the Environmental Costs of Logistics

- Arguments for and against the internalization of environmental costs
- Monetary valuation of environmental costs
- Internalization of the external costs imposed by road freight vehicles in the UK.

Module 2: Strategic Perspective

Restructuring Road Freight Networks Within Supply Chains

- Traditional network design
- Green network design
- Uncertainty in transport and supply chains
- Uncertainty mitigation approaches in road freight transport networks
- Gaps in our understanding and priorities for research
- Consequences and conclusions

Transferring Freight To 'Greener' Transport Modes

- Characteristics of the main freight transport modes
- Environmental impacts of the main freight transport modes

Case Study: Container Train Load Factors

- The policy framework
- Examples of measures aimed at achieving modal shift for environmental benefit.
- Rail and water industries

Development of Greener Vehicles, Aircraft and Ships

- Road freight
- Rail freight operations
- Air freight
- Shipping

Reducing the Environmental Impact of Warehousing

- Scale of the environmental impact
- Increasing resource intensity
- Framework for assessing the environmental impact of warehouses.
- Ways of reducing the environmental impact.

Module 3: Operational Perspective

Opportunities for Improving Vehicle Utilization

- Measuring vehicle utilization
- Factors affecting the utilization of truck capacity.

Optimizing the Routing of Vehicles

- Vehicle routing problems
- Types of problem
- Environmental impact

Increasing Fuel Efficiency in The Road Freight Sector

- Fuel efficiency of new trucks
- Vehicle design: aerodynamic profiling
- Reducing the vehicle tare weight
- Vehicle purchase decision
- Vehicle maintenance
- Increasing the fuel efficiency of trucking operations
- Benchmarking the fuel efficiency of trucks
- More fuel-efficient driving
- Fleet management

Reverse Logistics for The Management of Waste

- Waste management in the context of reverse logistics
- The impact of waste treatment legislation
- Reuse, refurbishment markets and take-back schemes.
- Managing waste as part of a sustainable reverse process

Module 4: Key Issues

The food miles debate: is shorter better?

- Transport and GHGs: is further worse?
- Transport, the second-order impacts and the implications for GHGs
- Local versus global and the self-sufficiency question

Sustainability Strategies for City Logistics

- Urban freight research and policy making
- Efficiency problems in urban freight transport
- Urban freight transport initiatives
- Urban consolidation centres
- Joint working between the public and private sectors
- Environmental zones

Benefits and Costs of Switching to Alternative Fuels

- Market developments of alternative fuels
- Current use of alternative fuels in the freight industry
- The future

E-Business, E-Logistics and The Environment

- Business-to-business (B2B)
- Business-to-consumer (B2C)
- Restructuring of the supply chain
- The future
- Public policy perspective

Module 5: The Role of Government in Promoting Green Logistics

- Objectives of public policy on sustainable logistics
- Policy measures
- Reducing freight transport intensity
- Shifting freight to greener transport modes
- Improving vehicle utilization
- Increasing energy efficiency
- Cutting emissions relative to energy use
- Government-sponsored advisory and accreditation

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