

WOMEN WORKFORCE IN THE PORT LOGISTICS SECTOR: A PERSPECTIVE IN INDIA

Abstract

The term Workforce majorly comprises of two sectors: Men and Women. The contribution of both the sectors of the Workforce makes optimum utilization of the human contribution. The participation of women in port logistics sector is specifically important as the port is the door for all imports and exports occurring in India and hence contributes significantly in the economic growth. In view of the enormous importance, in this article we have carried out a detailed investigation on the women participation in port logistics sector across Indian ports and compared the results with overall women participation across all sectors of jobs in India. Our results suggest that though the women participation in India has increased proportionately with increase in population, in almost all major Indian states, but that has not reflected in the port logistics sector. Further, our analyses show that the convergence of women work participation in India has not resulted in significant impact in the Net Domestic Product (NDP) which indicates the need for a revolutionary increase in women participation.

Keywords: Women workforce, port logistics, work infrastructure, society and economy

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I. INTRODUCTION

Women form an integral part to the progress of a society. Development of a country depends on the growth of the economy and society. When we point out the growth of society we must mention the role of women and their contribution towards family and society. Therefore, there has to be a balanced participation of men and women workforce for the nation building for faster and rapid growth of the society. “Women do two thirds of the world's work. Yet they earn only one tenth of the world's income and own less than one percent of the world's property. They are among the poorest of the world's poor.” Barber B. Conable, J

Although, no gender disaggregated official data is available, anecdotal evidence suggests that far fewer number of women entrepreneurs trade with neighbouring countries as compared to the rest of the world (Taneja et al., 2023). In today's global world international trade plays an important role in any country's development. Goods and services are exchanged across the globe and raw materials are traded across the countries especially through sea ports. Sea ports can trade bulk cargos at a cheaper rate which is essential for minimising the cost of production. Thus port logistics forms an integral part of the supply chain and operations management all over the world. Port logistics is nowadays the key word in any sector as it deals with the movement of goods and services from the producer to the receiver at the right place and at the right time. The theory of Comparative Advantage by Ricardo¹² has been recently proved right in March 2016 when Indonesia exported thermal coal to India at almost half the price of Indian coal, where India itself is rich in coal reserves (Source: Primary data from Indonesian Coal Traders). This explains that because of poor infrastructure the cost of extracting coals and ores is still expensive in India than Indonesia, the effect of which is that India imports coal from Indonesia. Hence India needs channelized investments for infrastructural development of ports and mines as well as efficient workforce representing both men and women to remove gender disparity strongly prevalent in this sector. Whether it is human resource or materials, the timely flow of the resources is most important in the competitive world market. The world economy has seen a recessionary phase since 2008 and many organisations related to international trade has experienced depression in its business cycle. India was always in the backseat in the infrastructure of sea ports which are the gateways of exchanging bulk goods. Again because of lack of efficient workforce and absence of the proper technological support, India has not been able to recover from the depression phase of port logistic sector in the current scenario. As compared to other developed countries like China, Russia, USA and UK the participation of women in the shipping and logistics sector in India is very negligible. This study reviews the importance of women and how women can actually contribute to the development of the freight world. The work of a logistician begins with bringing in the supplies necessary for a business or organization to operate from a registered office outside the port premises. Hence it is not necessary for women to be present in the sea port itself where basic hygiene facilities are lacking in India.

¹ Maneschi, Andrea (1998). *Comparative Advantage in International Trade: A Historical Perspective*. Cheltenham: Elgar. p. 1.

There is also lack of awareness of the work-culture of port logistics among Indian women. Indian women hardly know about the operations and their need in this sector. According to CSCMP³, (Women in Logistics panel 2015) worldwide 35 percent of logistics graduates are females whereas in India there are less than 5 percent female logistics graduates. This shows high disparity of sex-ratio in the discipline of logistics graduates in India. Almost none of the shipping and logistics companies employ women in freights and forwards in India. In this paper we have tried to highlight on the problems and prospects of women participation in the port logistic sector and have also made a comparative study with selected developed countries of the world.

II. WOMEN IN LOGISTICS SECTOR: INDIA AND THE WORLD

India is geographically surrounded by sea. The peninsular India has ports which generate a source of income for the local people. Not only this, the peninsular India is divided into two parts, range of eastern and western ports. In the eastern part the major ports are Haldia, Paradip, Dhamra, Vishakhapatnam, Ennore and Chennai. These ports handle bulk as well as container shipments from China, South Africa, Australia, Indonesia and far eastern ports of Russia. Shaw and Jones (2019) that highlighted the types of constraints that women experience in relation to trading opportunities, were especially useful in this regard. Land ports are important conduits for India's burgeoning regional trade. However, impediments faced by women at the land borders are a major reason for the low level of female participation in regional trade within South Asia (UNDP, 2016; Taneja et al., 2023).

According to the 1997 United Nations Report of the Economic and Social Council (UN, 1997), "mainstreaming a gender perspective is the process of assessing the implications for women and men of any planned action, including legislation, policies or programs, in all areas and at all levels. It is a strategy for making women's as well as men's concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of policies and programs in all political, economic and societal spheres so that women and men benefit equally and inequality is not perpetuated. The ultimate goal is to achieve gender equality."

³ Council of Supply Chain Management Professionals: CSCMP is widely recognized as a leader in cutting edge research to advance the supply chain management profession. The Research Strategies Committee undertakes the development of CSCMP's research agenda and oversees the projects. Depending on the research initiative, research teams use original data collection (primary research), secondary sources, or survey methods—or more typically a combination—that add advance knowledge and provide value to today's supply chain practitioner.



Figure: 1

Image Source: Land Ports Authority of India

In the western parts the major ports are Mundra, Kandla, Bedi, Porbander, Goa and Mumbai which handle bulk as well as container cargoes from USA, Australia, Russia through Black Sea, South Africa and Saudi Arabia. India is the second most populated country in world and women comprises of 48.5 percent of the population in India. The total workforce population comprises of 22 percent of women in India. The workforce in all the ports in India comprises negligible women participation both in the operations as well as physical port activities. In many ports of India women are restricted to enter the port premises. *Is the situation similar in all developed countries of the world? The fact is No.*

Due to the low participation of women in the port and logistics sector Narendra Modi honourable Prime Minister of India started the Sagar Mala Project for coastal states like West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra and Gujarat. Modi has enhanced the role of women by trying to promote women participation as sailors by providing benefits like 50% discount on fees for cadet training and age relaxation of 2 years. The port and harbour work is full of hard labour which is perceived in Indian society and the male domination at the ports restricts many women from joining the logistics sector. India needs to breakthrough this traditional mind set for a revolutionary developmental change. The hard physical labour consists of only 30% of the port and logistics work and the remaining work needs to be operational from a workplace which is not necessarily located inside the port premises. The structure of operational shipment work, which could be operated outside the port, from a workplace, is as follows:

- 1. Freight:** This is fixing the daily chartering charges of the ship with the ship owners. This could be in the form of Time charter or Voyage charter.

2. **Routing:** Guiding the master of the vessel about the shortest route from the start to the end point
3. **Bunkering:** The main bunkering station near to Eastern India is Singapore. The bunker prices of both DO (Diesel Oil) and FO (Fuel oil) and the time of bunkering the ships needs to be fixed in advance in order to avoid extra cost and delays.
4. **Fixing of Agencies:** Before the ship arrives to the port, the port formalities and port charges need to be paid in advance. This requires port agents.
5. **Port Documentation:** This is filling up forms and paying port charges so that the ship could berth without delay.
6. **Insurance:** The cargo as well as the ship in water is always on high risk when on sail. Hence Insurance is very essential.
7. **Inspection:** The cargo inspection at the loading as well as discharging ports has to be done to ensure the quality of material has been maintained as per the contract.
8. **Banking Requisites:** Payment to agents, insurance, inspection, port duties and bunkering has to be done through a proper banking channel and tracking that the transactions are made on time.

The above mentioned operations could be well handled by women from a workplace which does not need any hard labour. For the Indian shipping sector, which has been witnessing one of the worst phases since 2009 with falling revenues as well as increased operational cost, a greater participation from women would be a welcome change to stabilize the logistics sector. But the question is - Are the Indian women aware of the nature of work of the shipping operations and management? Looking into the work participation scenario of Indian women in this sector we can say that women in India are still behind many other developed countries in respect of joining this sector. When we are mentioning about women workforce in port logistics let us also focus on overall women workforce in India from the past to the recent past.

From table 1, we see that the women work participation rate has been constantly low since 1972 till recent past. In the rural sector the women workforce participation rate has rather decreased 31.8 to 24.8. This indicates that a major reform is required for the development of women not only by giving opportunities for employment but also offering them employment awareness programs which will help them to know the types of employment available in the market and their requirements. One such sector which women are still not aware of is the shipping logistic sector. This will help in reducing the unemployment and increase the standard of living and per capita income.

Table: 1 Growth rate percentage of women employment in Public & Private sector in India

Year	Growth Rate % of Public Sector	Growth Rate % of Private Sector	Total Growth rate %
1991	7.12	4.70	6.19
1992	0.77	1.38	1.00
1993	4.65	6.73	5.44
1994	0.90	0.67	0.81
1995	1.40	2.40	1.78
1996	1.31	10.10	4.70
1997	3.53	6.56	4.76
1998	1.29	5.32	2.95
1999	1.74	0.37	1.16
2000	1.65	2.35	1.94
2001	-0.25	1.80	0.61
2002	1.29	-2.58	-0.36
2003	0.62	0.73	0.67
2004	-0.51	-0.94	-0.68
2005	1.07	2.48	1.65
2006	2.81	1.10	2.09
2007	0.50	8.31	3.73
2008	0.73	7.76	3.77
2009	1.68	0.69	1.23
2010	3.40	6.99	5.00
2011	-0.78	4.51	1.62

Source: Ministry of Labor & Employment, Govt. of India (ON318)

Indian economy has seen a revolutionary change due to globalization in 1991 which is evident from the above table 2 where we find that the percentage of women employment was highest combining public and private sectors. But since then the growth of women employment has declined with negative employment growth in years like 2002 and 2004. This shows that with the increase in population of women, the growth of employment of women has declined over the period of twenty years from 1991 to 2011. The growth rate of employment of women has been calculated from the growth rate mentioned in *Harrods's* Growth model.

Development of employment in the port logistic sector will also generate employment opportunities in other sectors like international trade, banking, insurance and inspection agencies. Thus with the growth of port logistics and infrastructure the interdependent sectors as mentioned above are also expected to grow. Globally the women participation in the workforce in all sectors remained constant from 1990 to 2010. (Source: World Women 2010-Trends & Statistics,

United Nations, New York). The data also suggests that gender gap remains in the labor force participation all over the world.

III. PROBLEMS AND PROSPECTS OF WORKING WOMEN IN INDIA

The proportion of women in decision-making position is low all over the world as compared to men. It ranges from as low as 10 percent in under-developed countries to 40 percent in developed countries. The major problems that the Indian working women face irrespective of any sector are:

- Family as a barrier to the career
- Health hazards
- Ability to take risks
- Inability to dedicate herself completely to work
- Time issues
- Sanitary issues

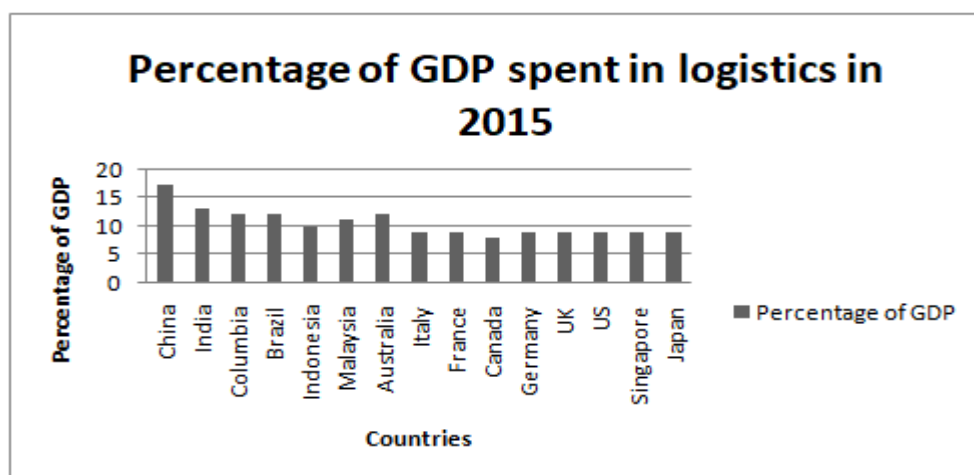
Due to conservative Indian society there have been several problems in the past decade which the women have been able to overcome by conviction. Jobs like working in petrol pumps, taxi driving, auto driving, and night duties in BPOs were exclusively men's job. But the glass ceiling of the Indian society has been broken in recent times. Women have been able to overcome though not all barriers, but tried to manage the difficulties imposed on them by the society.

However, due to lack of proper knowledge and training in logistics sector in India till now there has been negligible women work participation in this sector. If we see world-wide, a lot of research work and studies are being conducted to make logistics more efficient and attractive for women unlike India. Under graduate courses are rarely available where students can pursue their bachelors in logistics in India. A handful of institutes in India offer masters in Logistics. Hence a lot of the percentage of women does not even know properly about the area. The backbone needs to be strengthened for the logistics sector. The sooner the credentials and experience are obtained, the better it will be for the economy as a whole.

Problems of women in logistics sector and the current scenario of logistics sector in India Educated women working across various sectors are better managers of time as per statistics. In logistics, especially in shipping activities like fixing of freights of ships, keeping a close look on the movement of a freight market and channelizing the letter of credit on time through banks are all dependent on time and not on gender biasness. Therefore, women being better time managers can also prove to be an asset in the logistics sector. When we talk of the logistics sector we see negligible women participation in actual sailing on the sea. Sailors need to be on board the ship for months at a stretch which has still not been accepted by the Indian society for a woman. India's logistics market has been at \$92 billion and overall the sector grew at 1 to 1.3 times that of GDP according to consulting firm KPMG in 2013 and 1.5 to 2 times of GDP in 2015. Another consulting firm Frost and Sullivan, found that transportation and logistics market in India grew at a compounded annual growth rate of 7.2 percent between 2009 and 2013 although growth in last two years was only 4 to 5 percent mainly due to decline in exports and imports and a slowdown in domestic market's urban consumer markets. However, the freight traffic will grow at 2.5 times by 2020 from 2010

levels according McKinsey and Co. Study. In spite of this prospective growth, new jobs do not favour women in logistics sectors. Sanitary issues are the major problems in ports which act as the main hindrance to women physically working in ports. Hygiene conditions are well below acceptance level in the ports of India. Therefore, the conditions of work atmosphere are difficult for a woman and sometimes it becomes impossible for a woman to work at a stretch. As heavy material and dirty cargoes are handled in the port, so, it is very important to maintain health conditions and provide insurance to port workers. This will motivate more women to choose this profession as their career. Apart from health and hygiene another important factor is security. Work atmosphere should be cordial enough to attract woman workforce to work in ports.

However, we can present a brief picture of the how selected countries of the world have spent on logistics as percentage of GDP in the 2015. India has spent 13 percent of the GDP in the logistic sector and China has spent 17 percent of GDP in the logistic sector.



Source: Financial Express

Figure 2

Indian logistic sector serves as the backbone for some of the key sectors like pharmaceuticals, steel, cement automobiles retails etc. and the smooth functioning of this sector is essential.

While discussing about women in India let us now focus on the percentage of women employment in the logistics sector between 2010 and 2020. The data has been collected by a primary survey in the Coal Trans registration database.

Table 2: Percentage of women employment in logistics in India from 2010-2020

Age Group	Low/Mid-level positions	High level positions
20-30	13%	1%
30-40	11%	20%
40-50	2%	18%
50-60	nil	8%

Source: Coal Trans database, sample size=150

From table 3 we can see that young women work mostly in the low and mid-level positions and they get promoted to higher position very rarely in the logistics sector in India. The higher positions in logistics sector are mostly acquired by women from the business families in India. Women physically working in the port are close to nil as found in table 3. Women are basically employed in the support services in India in logistics sector. In a survey conducted by EMA Partners in 2004-05, to study leadership profile of 240 large corporations in India discovered that only 11 percent of the companies had women CEOs as compared to Fortune 500 companies, where women CEOs found to be only 3 percent. Amongst this more than half of women CEOs were found to be in the banking and financial services sector. Moreover, one third of the women CEOs were from the business family itself, which proves that climbing the corporate ladder for a woman in India is not an easy task.



Source: Data collected from major shipping & logistics companies in India

Figure 3

From fig 3 we find that women employment is highest in the Freight forwarding sector and lowest in the Ship Agents sector. Hence we can conclude that, since the nature of work of shipping agencies is mostly related to physical presence in ports like documentation in the port, ship clearance, berth hire payments in port offices, dealing with grab suppliers, crane suppliers and dealing with stevedores, hence the interest from both employer and employee ends are least in this sector for women in India.

However, we can focus on the work participation rate of women in India across selected states of India.

Table 3: Women Work Participation Rate in Selected States of India

S.L No	State/UT	Micro	Small	Medium	Total MSME
1	Andhra-Pradesh	33.74	0.13	0.00	33.87
2	Arunachal- Pradesh	0.22	0.00	0.00	0.23
3	Assam	12.10	0.04	0.00	12.14
4	Bihar	34.41	0.04	0.00	34.46
5	Chhattisgarh(C.G)	8.45	0.03	0.00	8.48
6	Delhi (UT)	9.25	0.11	0.00	9.36
7	Goa (UT)	0.70	0.00	0.00	0.70
8	Gujarat	32.67	0.50	0.00	33.16
9	Haryana	9.53	0.17	0.00	9.70
10	Himachal Pradesh	3.86	0.06	0.00	3.92
11	Jammu Kashmir	7.06	0.03	0.00	7.09
12	Jharkhand	15.78	0.10	0.00	15.88
13	Karnataka	38.25	0.09	0.00	38.34
14	Kerala	23.58	0.21	0.00	23.79
15	Madhya Pradesh	26.42	0.31	0.01	26.74
16	Maharashtra	47.60	0.17	0.00	47.78
17	Manipur	1.80	0.00	0.00	1.80
18	Meghalaya	1.12	0.00	0.00	1.12
19	Mizoram	0.35	0.00	0.00	0.35
20	Nagaland	0.91	0.00	0.00	0.91
21	Orissa	19.80	0.04	0.00	19.84
22	Punjab	14.56	0.09	0.00	14.65
23	Rajasthan	26.66	0.20	0.01	26.87
24	Sikkim	0.26	0.00	0.00	0.26
25	Tamilnadu	49.27	0.21	0.00	49.48
26	Telangana	25.94	0.10	0.01	26.05
27	Tripura	2.10	0.01	0.00	2.11
28	Uttar Pradesh	89.64	0.36	0.00	89.99
29	Uttarakhand	4.14	0.02	0.00	4.17
30	West Bengal(W.B)	88.41	0.26	0.01	88.67
31	A & N Island (UT)	0.19	0.00	0.00	0.19
32	Chandigarh (UT)	0.56	0.00	0.00	0.56

In table 4 we find that Maharashtra, Andhra Pradesh, Arunachal Pradesh Tamil Nadu and Karnataka have high women work participation rate. While states like Kerala, West Bengal, Punjab and Delhi have low work participation rate. In this context we can analyse the aspect that how the women work participation is actually spreading in India over the last two decades across states. We can use convergence testing analysis across states of in India for the women work participation rate.

Convergence of Women Work Participation (in all sectors) across States of India: The Convergence is tested according to the parametric estimate of the coefficient of the spread of women work participation in the initial year under reference. In the parametric regression, a *negative*, parametric estimate of the coefficient of work participation rate is interpreted as

evidence of convergence. This is done by first fitting a semi-logarithmic trend equation for each of the considered states in the following form:

$$\ln(\text{work participation}) = a + bt$$

where, $d\ln(\text{work participation})_i / dt = b$ indicates the growth rate of women work force for the i^{th} state over the period under consideration. We can use conditional β - convergence in the already fitted semi-logarithmic trend equation with state specific effect which is as follows:

$$d\ln(\text{work participation})_i / dt = \alpha + \beta \ln(\text{work participation})_{i0} + \gamma \ln(\text{Net state domestic product})_{i0} + v_{it}$$

where $t =$ time period (1991,2001 and 2011) and $i = 1,2,\dots,15$ states; $\ln(\text{work participation})_{i0}$ represents $\ln(\text{work participation})$ of each state in the initial year i.e 1991. $\ln(\text{Net state domestic product})_{i0}$ represents $\ln(\text{work participation})$ of each state in the initial year i.e 1991. v_{it} is the error term with 0 mean and finite variance and the mean is independent of $d\ln(\text{work participation})$ and $\ln(\text{Net state domestic product})$.

Table 5: Conditional β - convergence (women work participation) results of 15 states in India

Parameters	Pooled OLS	Std. error	t-statistics	Level of significance
Women work participation	-0.218	0.033	-6.634	0.000
Net state domestic product	0.019	.014	1.427	0.079
Constant	0.666	0.114	5.853	0.000
R ²	0.8			
F-Statistics	23.59			0.000

Source: Ministry of Labour and Employment, Govt. of India. (ON813)

The negative value of the coefficient of women work participation suggests that significant convergence of the states with respect to women work participation during 1991 to 2011. But the positive value of the slope coefficient of the net state domestic product clearly shows that there have been lesser signs of convergence of states with respect to state domestic product during the period 1991 to 2011. With the significant convergence result of the women work participation across states of India it is clear that over time due to government initiatives or due to social change, more women are willing to work across India. In many of the Indian states like Arunachal Pradesh it is found that with increase in women work participation there is no impact on the Net State Domestic product. From the analysis of convergence in table 5 it is also revealed that with convergence of women work participation there has been no sign of convergence of Net State Domestic Product across states.

The reason for this could be:

- Women are working in unorganised-sector⁴ with low paid jobs.
- Since work participation does not mean employment only therefore, increase in work participation of women means women's willingness to work but not actual employment in organised sector.
- This also reveals that women are not aware of the proper jobs that suit their ability and qualification and hence they remain underpaid and under-employed⁵.
- This may also indicate that women may not be qualified enough due to lack of facilities and social barriers which restricts them to get proper employment which could significantly show their contribution to the Net State Domestic Product.

IV. CONCLUSIONS & FUTURE PERSPECTIVES

In the paper we have found that women in India have become progressive over time as their participation in the workforce has increased. The highly skewed distribution of workforce of males in the port logistics sector is one of the major reasons of the declining growth in this sector. In the perspective of port logistic women are not enough aware of this sector and hence their participation is not visible. Hence we can conclude that India needs proper growth of infrastructure of port-logistics to make it compatible enough for women and make provisions for training and development of women workforce to participate in this sector. Part-time employment opportunities are there in all the developed countries of the world which is a very good way to involve women into work. Part-time employment opportunities suits very well in the port logistics sector such as freight market negotiations, banking and port logistics operations. Women being the integral part of the society, government should take more initiatives to create opportunities for women employment in the organised sector so that the contribution of women could also be revealed in the national income. Apart from infrastructure facilities in ports, women physically working in the port should be given life insurance provisions and healthcare facilities which will act as a catalyst for women to participate in this sector. Finally, India being a peninsular country surrounded by sea on its three sides has potential of employment in and around the port. Hence the growth of the port logistics sector is important equally for men as well as women employment for the growth of Indian economy as a whole.

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⁴ The term unorganised sector in Indian context as defined by National Commission for Enterprises in the unorganised sector is 'consisting of all unincorporated private enterprises owned by individuals and households engaged in the sale or production of goods and services operated on a proprietary or partnership basis with less than ten workers'.

⁵ Under-employment refers to a job that is insufficient in some important way for a worker, relative to standard, which results in the under-utilisation of the worker.

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