



centre for  
entrepreneurship  
development



## **WORKING PAPER-1**

**Dec 2020**

# **Demystifying the Workers' Ratio of Export Oriented RMG Factories in Bangladesh: Perspective from Mapped in Bangladesh (MiB)**

*Sadril Shajahan, Md. Faizul Islam,  
Fahim S. Chowdhury and Faria Ahmad*

# Demystifying the Workers' Ratio of Export Oriented RMG Factories in Bangladesh: Perspective from Mapped in Bangladesh (MiB)

*Sadril Shajahan<sup>1</sup>, Md. Faizul Islam<sup>2</sup>, Faria Ahmed<sup>3</sup> and Fahim S. Chowdhury<sup>4</sup>*

## Introduction

The Mapped in Bangladesh (MiB) project, previously known as the Digital RMG Factory Mapping in Bangladesh (DRFM-B), was initiated in 2017 by Centre for Entrepreneurship Development (CED) of Brac University backed by the succession of its pilot phase titled 'Participatory Factory Mapping Research' (PFMR). The project was materialized after the Rana Plaza incident when bridging the knowledge gap of the garment industry of Bangladesh had become mandatory to avoid misconceptions, misinformation and misinterpretations. The MiB project is now exhibiting data of export oriented garment factories in the digital interactive map<sup>5</sup> which has already been able to shed light on one of the common, important, and sensitive misconceptions of the ready-made garment (RMG) sector that women constitute 80 percent of the garment workers and thus challenges the notion by envisaging that male-female workers ratio in Bangladesh garment sector is not 20:80.

The media often mentions that the garment sector is comprised of 80 percent female workers. Such information has also been mentioned in the website of Clean Clothes Campaign (n.d.), in the report of Fair Wear Foundation (Standing Firm against Factory Floor Harassment 2013), in the report commissioned by the Copenhagen Consensus Centre (Shadat *et al.* 2016) and in the academic contribution of a number of authors (Anwary 2017, Khatun & Shamsuzzaman 2017, Akhter, Rutherford, & Chu 2019).

The objective of the ongoing MiB project is to enable accountability and transparency in the RMG sector by providing industry stakeholders authentic factory data. To implement the project, MiB has been strategically partnered with Bangladesh Garments Manufacturers and Exporters Association (BGMEA) and Bangladesh Knitwear Manufacturers and Exporters Association (BKMEA) while the project has been receiving strategic supports from Department of Inspection for Factories and Establishments (DIFE). Being coordinated by BRAC, the four-year project (2017-2021) MiB is funded by the Laudes Foundation (formerly C&A Foundation) and the Embassy of the Kingdom of the Netherlands (EKN). According to its methodology<sup>6</sup> (Brief Methodology n.d.), MiB not only collects factory data, but also publishes the data in the digital map after a rigorous verification and validation process. At present, the map hosts data of 3,212 export-oriented garment factories, with fraction of

---

<sup>1</sup> Sadril Shajahan, Research Associate, MiB, CED, BracU

<sup>2</sup> Md. Faizul Islam, Research, M&E Associate, CED, BracU

<sup>3</sup> Faria Ahmed, Senior Manager (Research & Knowledge Management), CED, BracU

<sup>4</sup> Fahim S. Chowdhury, Senior Research Associate, CED, BracU

For Correspondence: Sadril Shajahan, sadril.shajahan@bracu.ac.bd

<sup>5</sup> <https://mappedinbangladesh.org>

<sup>6</sup> Brief Methodology of Mapped in Bangladesh (MiB), <https://mappedinbangladesh.org/wp-content/uploads/2019/05/MiB-Methodology-.pdf>

female workers at 58 percent. This is far below the widespread claim of 80 percent female labor force working in the sector.

The aim of this research brief is to utilize MiB dataset for unearthing the male-female ratio of garment workers in terms of clusters that are factory concentrating, factory type, factory membership and factory size. Additionally, this paper also explores previous studies and statistics with similar concern. Such review is rudimentary yet necessary because different studies and reports have drawn various results regarding the ratios of male-female workers and most of those ratios are nowhere near to 20:80. However, the debate over the ratio has not received any contribution neither from the academia nor from the side of the other stakeholders such as trade associations, NGOs or INGOs. Instead, different commentators and sources kept mentioning the male-female workers' ratio as 20:80. This may be for the reason that so far the stakeholders of the sector have not received updated data and at the same time, data updating of the RMG industry has not been incentivized. Therefore, this brief is not only contributing to an existing debate but also expanding the debate with a discussion deriving from previous literature and recent data of MiB project collected from a large pool of population which is export-oriented garment factories in Bangladesh.

The garment industry can be classified as establishments that cut and/or stitch/make up garment out of woven or knitted fabrics without being involved in the manufacture of fabrics (Siddiqi 2004). It needs to be noted that, MiB's scope covers only the export-oriented garment factories who are involved in either direct or indirect export(s). Direct export denotes factories that directly export its products to foreign customers (brands/buyers). Indirect export means factories who support the direct exporter factories by providing indirect sourcing (i.e., subcontracting), and thus, involved in (indirect) export. A factory is considered to be export oriented in MiB map if it utilizes 80 percent or more of its capacity for export or 80 percent or more of its productions are exported. Various literatures depicted the garment industry based on the core processes of RMG assembly.

## **Methodology**

The discussion of this brief is based on two parts. The first part is drawn from a desk review of recent studies and relevant explanations to explore how these sources have addressed the male-female workers' ratios of the garment sector in Bangladesh. Thus, the discussion of this part will help to formulate possible questions that can be traced in future through further research. In the second part of the discussion, male-female ratios of the export-oriented RMG factories from the MiB dataset will be analysed disaggregated by the following categories: location, types, membership and size of the factories.

As per the methodology of MiB factory census, the data has been collected using a questionnaire from the export-oriented garment factories of four major garment producing clusters of Bangladesh, namely - Dhaka district, Gazipur district, Narayanganj district and Chattogram district. The rest of the districts are being considered as the fifth cluster for MiB and the coverage of the fifth cluster has not been completed yet.

Although the project started from April 2017, the data collection from factories was started in May 2018 from Dhaka cluster. Later, the project started its census respectively in Gazipur in August 2018, Narayanganj in April 2019, and in Chattogram in December 2019. However, data collection from a segment of Chattogram cluster was held up due to Covid-19 situation.

It also should be pointed that 3,212 export-oriented garment factories used in the analysis of this brief are neither the entire population of garment factories in Bangladesh nor all the export oriented factories of MiB that the project has collected. Till 30 November 2020, MiB research team has been able to draw these RMG factories from MiB map only for the preparation of the brief.

### **Discussion from Desk Review**

Referring to BGMEA, Bangladesh Bureau of Statistics (BBS) has reviewed in Gender Statistics 2018 that women employees in the garment industry was 3.20 million in 2012-13 among the total 4 million workers. The figure was four times higher than men employees. Just as 2012-13, the women workers in garment sector remained 80 percent for the year 2013-14, 2014-15 and 2015-16 (BBS, 2018).

However, on 4 September 2019, The Daily Prothom Alo reported the statistics of BBS according to which 53.82 percent male workers occupy jobs in the sector and the number of female workers is only 46.18 percent (Jahan, 2019). In another earlier survey, BBS found that women represented 64 percent of the RMG sector's 2,762,334 employees (BBS 2012). As per the Labour Force Survey 2017 of BBS, an estimated around 3.2 million workforce is employed in the RMG (Islam, 2018).

Therefore, it is not just the male-female ratio of workers but the total number of workers in the RMG sector of Bangladesh also has confusing conclusions. While such number requires separate attention for further exploration, what needs to be reviewed is how other studies are referring the male-female ratio of garment workers.

Compiling district wise gender segregated data of 4841 RMG factories from DIFE published in 2017, Bangladesh Institute of Labor Studies (BILS) showed that male to female workers ratio is 43:57 (Islam 2018). The study of Asian Center for Development (2015) on 173 factories found that male to female ratio of RMG workers is 35:65. Center for Policy Dialogue (CPD) surveyed 226 enterprises and 2,123 workers for the study titled 'New Dynamics in Bangladesh's Apparels Enterprises: Perspectives on Restructuring, Upgradation, and Compliance Assurance' (Moazzem *et al.* 2019) and remarked that worker composition in the garment sector has experienced changes over time as the percentage of female workers has reduced from 58.4 percent in 2012 to 53.2 percent in 2016. A baseline study for International Labour Organizations (ILO) titled "Improving Working Conditions in the Bangladesh Ready Made Garment Sector" (SANEM 2019) surveyed 111 ready-made garment factories and found women's share of the workforce was 61.17 percent while for men it was 38.83 percent. However, the study acknowledged that 4 million workers are employed in the ready-made garment industry in Bangladesh. For the issue brief of ILO titled 'Understanding the Gender Composition and Experience of Ready-Made Garment (RMG)

Workers in Bangladesh’, researchers collected data from 260 enterprises and revealed that women accounted for 60.5 percent of their workers in 2018, a decline from 63.4 percent in 2010 (Mastuura & Teng 2020).

Table 1 summarizes the different male to female ratios of garment workers in Bangladesh based on the data of different organizations and studies.

**Table 1: Garment Workers’ Ratio in Bangladesh Reported by Various Organizations**

Organizations Reporting the Workers’ Ratio	Years of Reporting the Male-Female Ratio					
	2010	2012	2015	2016	2018	2019
Bangladesh Bureau of Statistics (BBS)	-	36:64	-	-	20:80	54:46
Bangladesh Institute for Labour Studies (BILS)	-	-	-	-	-	43:57
Center for Policy Dialogue (CPD)	-	42:58	-	47:53	-	-
Bangladesh Asian Center for Development	-	-	35:65	-	-	-
International Labour Organizations (ILO)	37:63	-	-	-	40:60	39:61

These sources along with several other studies and reports attempted to explain how there has been a change in the gender composition of garment workers. Raihan and Bidisha (2018) states that the decline of RMG factories, from 5,876 in 2012-13 to 4,222 in 2013-14, have important implications for female employment in the manufacturing sector in Bangladesh, while stakeholders in RMG suggested that the major structural change in the RMG industry had been the introduction of labour-saving machineries for the kind of jobs that previously mostly low-skilled female workers carried out.

On 7 December 2017, The Daily Star reported a study of the Bangladesh Institute of Development Studies (BIDS) according to which one of the major factors behind the declining trend of women employment was the closure of subcontracting in the garment sector after the Rana Plaza building collapse in April 2013 (Female Employees on the Decline 2017). The study also marked two other reasons - withdrawal of temporary jobs, especially in urban areas, with the rise of family income, and the withdrawal of female workers from part-time jobs.

A number of studies and commentators linked the change of the gender composition of the apparel sector workforce in recent years with the growth of the knitwear industry which employs more men than women. As Hossain (2012) explains knitwear manufacturing is seen as ‘men’s work’ while it has been believed that women are less capable of the physical and skill demands of the machinery used in knitwear and sweater production. As per Hossain (2012), female workers are concentrated in the woven factories, where gendered pattern of the occupation structure tend to be men dominated for senior management positions, supervisors and skilled technicians (e.g., cutters, finishers); most machine operators and helpers are women and girls. Referring to the World Bank Bangladesh Job Diagnostic 2017, which suggested estimations that men made up 54 percent of the labor force in the garment sector in 2016, Kabeer *et al.* (2019, p.5) mentions “*The rise of the knitwear sector has been*

*accompanied by a rising share of male employment in the industry, partly because knitwear firms operate their knitted fabric making sections through the night and partly the widespread use of piece work makes it possible to achieve higher earnings, attracting male workers”.*

The ILO’s issue brief (Mastuura & Teng 2020) shows the gender segregated data by major production sections according to which men constituted of 57.6 percent in the knitting section in 2010, further increasing to 61.9 percent in 2018. Within the same time period, men’s participation has also increased in cutting from 59.3 percent to 59.8 percent, while from 37.3 percent to 42 percent in finishing. There are a number of other production processes where the workers’ ratio remained almost stagnant among the surveyed factories of the study. These processes are dying, washing and embroidery where the male-female workers’ ratios are 98:2, 83:17 and 99:1 respectively. These ratios remain the same during both 2010 and 2018. However, in the sewing section, women constitute 70.1 percent and 67.4 percent in 2010 and 2018 respectively.

It has been believed that Bangladeshi females are traditionally expert in sewing (Rahman & Siddiqui 2015). ILO Better Work also remarks that 80 percent of line-operators in the sewing sections of the garment sector are women (Bangladesh Factories Set for More Female Supervisors 2019).

A question can be raised that whether the widely used information of 80 percent women workers in the garment sector are being inappropriately influenced by the dominance of women workers in the sewing lines. At the same time, another question can be raised based on the data reviewed by the ILO Baseline study (SANEM 2019) that whether women workers ever accounts for 80 percent in the total labor force within the near past. This is because the ILO baseline study reviews the trends from the Survey of Manufacturing Industry (SMI) data in Bangladesh and suggests that women participation has not decreased from 80 percent to 61 percent; rather women participation was in the range of 72 to 76 percent from 1985 to 1994, and gradually declined within a range of 65 to 70 percent during 1994 to 2012.

Kabeer and Mahmud (2004) also pointed out that female share of new employment in the industry was 39 percent in the mid-1990s and rose to 60 percent in 2000. Such result is a more pronounced ‘feminization’ of the labor force in urban areas where the urban female labor force grew by one-third every year compared to an annual growth of only 9 percent for the male labor force between the mid-1980s and mid-1990s. However, estimates of the labor force in 1985 ranged from 80,000 and 250,000, with around 85 percent being female (Kabeer *et al.* 2019).

## **Discussion from the Analysis of MiB Data**

Before presenting the MiB data on gender ratio of the garment workers, it needs to be noted that how large the sample size that MiB deals comparing the previous studies mentioned above. Table 2 demonstrates the comparison.

**Table 2: Sample Size of Surveyed Factories/Enterprises from Existing Studies**

<b>Name of the Studies/Research Initiatives with Publication Year</b>	<b>Organizations</b>	<b>Sample Size</b>
Garment Workers in Bangladesh: Social Impact of the Garment Industry 2015	Asian Center for Development	173
New Dynamics in Bangladesh's Apparels Enterprises: Perspectives on Restructuring, Upgradation, and Compliance Assurance (2019)	Center for Policy Dialogue (CPD)	226
Baseline Study-Improving Working Conditions in the Bangladesh Ready Made Garment Sector (2019)	ILO	111
Issue Brief: Understanding the Gender Composition and Experience of Ready-Made Garment (RMG) Workers in Bangladesh (2020)	ILO	260
Mapped in Bangladesh (Ongoing)	Centre for Entrepreneurship Development (CED), Brac University	3,212

Even with the larger sample size, the conclusions regarding gender ratio of garments workers will be similar to the most of the previous studies which only proves the point that at present women workers in Bangladesh do not have the share of 80 percent in the garment sector.

**Table 3: Cluster wise Male-Female Ratio of Garment Workers**

<b>Clusters</b>	<b>Number of Factories</b>	<b>Male Workers</b>	<b>Female Workers</b>	<b>Total</b>	<b>Male to Female Ratio</b>
Dhaka	1,160	323,700	505,707	829,407	39.03:60.97
Gazipur	1,053	531,799	662,356	11,94,155	44.53:55.47
Narayanganj	613	153,389	174,089	327,478	46.84:53.16
Chattogram	386	57,453	157,268	214,721	26.76:73.24
<b>Total</b>	<b>3,212</b>	<b>1,066,341</b>	<b>1,499,420</b>	<b>2,565,761</b>	<b>41.56:58.44</b>

Table 3 shows that the percentage of women workers are lowest (53.16 percent) in Narayanganj which is the district having highest knit factories of the country. In Dhaka, women workers constitute almost 61 percent according to MiB data while the ILO's issue brief depicted 58.7 percent women workers in Dhaka among the surveyed factories in 2018 (SANEM 2019). Surprisingly, in Chattogram, women workers constitute 73.24 percent, while Gazipur accounts for 55.47 percent female workers as per MiB data. The study by CPD reported relatively higher share of female workers in Narayanganj and Chattogram (76.6 percent) in 2016 (Moazzem *et. al* 2019). Comparing between the data of CPD and MiB, it can be said that the major changes in the gender ratio of garment workers have occurred in Narayanganj having concentration of most knit factories, while the ratio experienced a little decline in Chattogram probably because most factories based in Chattogram are woven factories.

**Table 4: Workers' Ratio in terms of Factory Type**

Factory Type	Number of Factories	Male Workers	Female Workers	Total	Male to Female Ratio
Knit	1,368	427,495	547,045	974,540	43.87:56.13
Woven	983	358,086	654,266	1,012,352	35.37:64.63
Sweater	534	201,306	131,311	332,617	60.52:39.48
Mixed*	327	79,454	166,798	246,252	32.27:67.73
<b>Total</b>	<b>3,212</b>	<b>1,066,341</b>	<b>1,499,420</b>	<b>2,565,761</b>	<b>41.56: 58.44</b>

\* **Mixed**: Factories having combination of production processes such as knit and non-RMG, knit and sweater, knit, woven and sweater, knit and woven, and woven and sweater.

Table 4 depicts higher number of male workers in knit and sweater factories, 43.87 percent and 60.52 percent respectively. Additionally, the table complements the reviewed literature according to which woven factories are supposed to have greater share of female workers, which from MiB data is 64.63 percent. There is another category of factory which is the 'mixed category' having combination of production processes such as a) knit and non-RMG, b) knit and sweater, c) knit, woven and sweater, d) knit and woven, and e) woven and sweater. The male to female ratio for this category is 32:68.

**Table 5: Workers' Ratio in Sweater Factories in Narayanganj**

Sweater Machine Type	Number of Factories	Male Workers	Female Workers	Total	Male to Female Ratio
Manual	16	2,431	1,289	3,720	65.35:34.65
Jacquard	12	4,488	3,557	8,045	55.79:44.21
Both	15	3,725	3,600	7,325	50.85:49.15
<b>Total</b>	<b>43</b>	<b>10,644</b>	<b>8,446</b>	<b>19,090</b>	<b>55.76:44.24</b>

The sweater factories have been going through major technological shifts where manual machines are being replaced by automatic Jacquard machines. As a result, MiB has decided to put a detail attention to sweater factories by incorporating additional information of sweater factories in the questionnaire for Narayanganj and Chattogram clusters. Table 5 shows the gender ratio in Sweater Factories in Narayanganj, and Table 6 shows the gender ratio for Chattogram taking into consideration whether the factories are manual machine based, jacquard based or uses both types of machines.

**Table 6: Workers' Ratio in Sweater Factories in Chattogram**

Sweater machine Type	Number of Factories	Male Workers	Female Workers	Total	Male to Female Ratio
Manual	30	3,959	2,373	6,332	62.52:37.48
Jacquard	4	1,036	1,689	2,725	38.02:61.98
Both	5	918	717	1,635	56.15:43.85
<b>Total</b>	<b>39</b>	<b>5,913</b>	<b>4,779</b>	<b>10,692</b>	<b>55.30:44.70</b>

Both Table 5 and 6 depicts that factories with manual machines tend to have more male workers than females. This is intuitive since operating manual machines require more



strength and physical labor, and hence is male dominated while ratio of female workers is comparatively higher for factories with jacquard machines.

**Table 7: Gender Ratio in terms of Trade Association Membership**

Membership	Number of Factories	Male Workers	Female Workers	Total	Male to Female Ratio
Only BGMEA	1,872	744,483	10,99,865	1,844,348	40.36:59.64
Only BKMEA	488	110,533	133,962	244,495	45.21:54.79
Both	260	164,808	197,626	362,434	45.47:54.53
Non-Member	592	46,517	67,967	114,484	40.63:59.37

Table 7 depicts higher number of female workers - 55 percent compared to 45 percent of male workers in the 488 factories having BKMEA membership. Similar gender ratio is also noted for the 260 factories which have both BGMEA and BKMEA memberships. The gender ratio is almost similar in factories having only BGMEA membership and factories having no membership or the non-member factories. Male-female ratio is 40:60 when it comes to BGMEA factories, while it is around 41:59 for non-member factories.

**Table 8: Gender Ratio by Factory Size (Based on Category of CPD)**

Factory Size	Number of Factories	Male Workers	Female Workers	Total	Male to Female Ratio
Small: Below 500	1,761	142,350	241,777	384,127	37.06:62.94
Medium: 500 – 2,500	1,263	570,105	816,805	1,386,910	41.11:58.89
Large: More than 2,500	188	353,886	440,838	794,724	44.53:55.47

CPD used the following criterion for defining factory size - factories employing less than 500 workers are classified as ‘small’, medium factories employ 500-2,500 workers, and large factories were classified as having more than 2,500 workers (Moazzem & Radia 2018). Following the same category, MiB finds that the proportion of female workers is higher at 62 percent in small factories compared to 58.89 percent and 55.47 percent respectively in medium and large factories. The study by CPD also notes that the proportion of male workers in large factories increased from 28 percent in 2012 to 31 percent in 2016.

**Table 9: Gender Ratio by Factory Size (Based on the Category of ILO-IFC Study)**

Factory Size	Number of Factories	Male Workers	Female Workers	Total	Male to Female Ratio
Small: Below 1,000	2,421	323,723	520,069	843,792	38.37:61.63
Medium: 1,000 – 3,999	716	541,977	735,174	1,277,151	42.44:57.56
Large: 4,000 and above	75	200,641	244,177	444,818	45.11:54.89

According to the report of IFC and ILO titled as ‘Remediation Financing in Bangladesh’s Ready Made Garment Sector: An Overview’, RMG enterprises have been categorized in terms of number of employees where small enterprises have less than 1,000 employees, medium enterprises have 1,000-3,999 employees and the number of employees for large

enterprises is 4,000 and above (Remediation Financing 2016). Using the same category for garment workers, MiB generates the same result that compared to male workers; female workers are higher in small enterprises (61.63 percent). Female share in medium and large enterprises are 57.56 percent and 54.89 percent respectively in comparison to male workers.

**Table 10: Gender Ratio by Factory Size (Based on the Category of Bangladesh Industrial Policy 2015)**

Factory Size	Number of Factories	Male Workers	Female Workers	Total	Male to Female Ratio
Small: 1 - 50	211	3,533	3,367	6,900	51.20:48.80
Medium: 51 - 1000	2,210	320,190	516,702	836,892	38.26:61.74
Large: More than 1000	791	742,618	979,351	1,721,969	43.13:56.87

As the table 10 shows, the workers range for determining the size of an industry is lower in Bangladesh Industrial Policy 2015 (Ministry of Industries 2015) which also influences to generate the male-female ratio of 51:49 in small factories from MiB data as demonstrated in Table 10. The proportion of women is more in medium and large factories (62 percent and 57 percent respectively) compared to small factories (49 percent).

### Limitations

Even with a large sample size of the factories from the MiB data, it is still not possible to claim that the data presented above are representing the entire industry. This is because the data has been published only those of RMG factories which are exporting at least 80 percent of their total productions.

Moreover, the data collection from the factories took place in four different time periods for the four clusters. As a result, the data is not entirely up to date and does not correspond to the scenario of the gender ratio of the garments workers within any specific year rather the collected data represents a time period of 2018 to 2019.

Currently, the MiB map is showing data that has been collected before Covid-19 pandemic breaks out and ravages the RMG sector of Bangladesh. On 23 June 2019, New Age reported that 24,860 workers lost their jobs according to DIFE (24,860 RMG Workers Fired after Eid 2020). Therefore, the workers' numbers found in MiB data and used in this brief have not been remained the same after the pandemic period has started.

The analytical framework of this brief is limited to presentation of MiB data on gender based ratios of garment workers and as no comparison of such data with previous studies was possible thus without pursuing any explanation to what extent and why the gender ratios of garment workers have changed is missing in the brief.

### Conclusions

Although the data of MiB has brought interesting insights in terms of gender ratio of male female workers in RMG industry, a number of actions need to be taken to lead the research

on the ratio of garment workers for further explorations and explanations. For example, industry wide data is required to know to what extent knit factories have increased since the growth of the RMG sector to understand how much it has contributed to the male workers in the sector. Additionally, sweater factories require a separate attention to learn how emergence of jacquard machines are influencing the gender composition within factories.

Moreover, gender ratio of male-female workers needs to be observed for factories that cater for the export market by lowering the threshold of the export percentage from 80 percent. At the same time, confusions should be clarified regarding how many workers are involved in the RMG study along with determination of the size of the factories in terms of a fixed category of workers' number.

Nationwide and industry-wide data on workers' gender ratio in terms of production processes of RMG factories can be valuable to point out which processes are male oriented and which are female oriented.

Along with quantitative interpretations, tools from qualitative study should be applied to interview industry experts and insiders for in-depth understanding of actors influencing the gender ratio of the garment workers and the impact of the change in the industry.

Although MiB has covered four major garment producing clusters of Bangladesh, there are still more export-oriented garment factories outside these four clusters which MiB has not published yet. Additionally, MiB has not received access into the factories located in the Export Processing Zones (EPZ) of Bangladesh. Inserting information of these factories would enrich the workers' data along with the overall factory data of the digital map of MiB.

## References

- ‘24,860 RMG workers fired after Eid’, 2020, *New Age*, 23 June, viewed 08 December 2020, from <https://www.newagebd.net/article/109175/24860-rmg-workers-fired-after-eid>
- Akhter, S., Rutherford, S., Chu, C., 2019, ‘Sufferings in Silence: Violence against Female Workers in the Ready-Made Garment Industry in Bangladesh: A Qualitative Exploration’, *Women's Health*, 15, viewed 02 December 2020, from <https://journals.sagepub.com/doi/full/10.1177/1745506519891302>
- Anwary, A., 2017, ‘Feminised Workforce in Transnational Production: Bangladesh Ready-made Garment Industry’, *History and Sociology of South Asia*, 11(2), 174-191, viewed 01 December 2020, from <https://journals.sagepub.com/doi/10.1177/2230807516686419>
- Asian Center for Development, 2015, *Garment Workers in Bangladesh: Social Impact of the Garment Industry*, Dhaka, viewed 08 December 2020, from <http://acdonline.org/wp-content/uploads/2015/03/Garment-Worker-Survey-Summary-Report-2015.pdf>
- Bangladesh Bureau of Statistics (BBS), 2018, *Gender Statistics of Bangladesh 2018*, BBS, Dhaka, viewed 02 December 2020, from [https://bbs.portal.gov.bd/sites/default/files/files/bbs.portal.gov.bd/page/b343a8b4\\_956b\\_45ca\\_872f\\_4cf9b2f1a6e0/Gender%20Statistics%20of%20Bangladesh%202018.pdf](https://bbs.portal.gov.bd/sites/default/files/files/bbs.portal.gov.bd/page/b343a8b4_956b_45ca_872f_4cf9b2f1a6e0/Gender%20Statistics%20of%20Bangladesh%202018.pdf)
- Bangladesh Bureau of Statistics (BBS), 2012, *Survey of Manufacturing Industries (SMI) 2012*, BBS, Dhaka, viewed 08 December 2020, from <http://203.112.218.65:8008/WebTestApplication/userfiles/Image/LatestReports/SMI-%202012.pdf>
- ‘Bangladesh factories set for more female supervisors’, *Better Work*, viewed 09 December 2020, from <https://betterwork.org/2019/03/14/bangladesh-factories-set-for-more-female-supervisors/>
- Brief Methodology of Mapped in Bangladesh (MiB), n.d., *Mapped in Bangladesh*, viewed 02 December 2020, from <https://mappedinbangladesh.org/wp-content/uploads/2019/05/MiB-Methodology-.pdf>
- Clean Clothes Campaign, n.d., *Gender: Women workers mistreated*, viewed 08 December 2020, from <https://cleanclothes.org/issues/gender>
- ‘Female Employees on the Decline’, 2017, *The Daily Star*, 7 December, viewed 07 December 2020, from <https://www.thedailystar.net/business/female-employees-the-decline-1501456>
- Hossain, N., 2012, *Women’s Empowerment Revisited: From Individual to Collective Power Among the Export Sector Workers of Bangladesh*, IDS Working Papers, viewed 08 December 2020, from <https://www.researchgate.net/publication/254932933>

Islam, M.M., 2018, *A Situation Analysis Study Workers Rights & Gender Based Violence in the RMG and TU capacity to Deal with These*, Bangladesh Institute of Labor Studies (BILS), Dhaka, viewed 08 December 2020, from <http://bilsbd.org/wp-content/uploads/2018/01/Workers-Rights-Gender-Based-Violence-in-the-RMG-and-TU-Capacity-to-Deal-with-These-Final-Draft.pdf>

Jahan, M. 2019, 'Women Workforce Declining in RMG Sector', *The Daily Prothom Alo*, 4 September, viewed 08 December 2020, from <https://en.prothomalo.com/bangladesh/Women-workforce-declining-in-RMG-sector>

Kabeer, N., Huq, L., & Sulaiman, M., 2019, *Multi-stakeholder Initiatives in Bangladesh after Rana Plaza: Global Norms and Workers' Perspectives*, Garment Supply Chain Governance Project, Berlin, viewed 08 December 2020, from [https://www.wiwiss.fu-berlin.de/forschung/Garments/Medien/Discussion-Paper-Garment-Governance-01-2019\\_Multistakeholder-initiatives-in-Bangladesh-after-Rana-Plaza.pdf](https://www.wiwiss.fu-berlin.de/forschung/Garments/Medien/Discussion-Paper-Garment-Governance-01-2019_Multistakeholder-initiatives-in-Bangladesh-after-Rana-Plaza.pdf)

Kabeer, N and Mahmud, S., 2004. 'Rags, Riches and Women Workers: Export-oriented Garment Manufacturing in Bangladesh', in Commonwealth Secretariat (ed.), *Chains of Fortune: Linking Women Producers and Workers with Global Markets*, Commonwealth Secretariat, London, viewed 12 December 2020, from <https://www.wiego.org/sites/default/files/migrated/publications/files/Kabeer-Mahmud-Export-Oriented-Garment-Bangladesh.pdf>

Khatun, R. & Shamshuzzaman, M, 2017, 'Job Satisfaction of RMG Sectors in Bangladesh: A Study on Female Workers of AKH Group', *International Journal of Humanities & Social Science Studies (IJHSSS)*, 3 (6), 97-106, viewed 03 December 2020, from [https://www.ijhsss.com/files/9\\_68a665f7.-Razia-Khatun-2.pdf](https://www.ijhsss.com/files/9_68a665f7.-Razia-Khatun-2.pdf)

Mastuura, A. & Teng, C. 2020, *Understanding the Gender Composition and Experience of Ready-Made Garment (RMG) Workers in Bangladesh*, International Labour Organization, ILO, Geneva, viewed 08 December 2020, from [https://www.ilo.org/wcmsp5/groups/public/--asia/---ro-bangkok/---ilo-dhaka/documents/publication/wcms\\_754669.pdf](https://www.ilo.org/wcmsp5/groups/public/--asia/---ro-bangkok/---ilo-dhaka/documents/publication/wcms_754669.pdf)

Ministry of Industries, *Bangladesh Industrial Policy 2015*, Government of the People's Republic of Bangladesh, Dhaka, viewed 05 December 2020, from [https://moind.gov.bd/sites/default/files/files/moind.portal.gov.bd/policies/92beabe3\\_5f4d\\_4d6d\\_840a\\_23e06daf5062/Industrial\\_policy2005.pdf](https://moind.gov.bd/sites/default/files/files/moind.portal.gov.bd/policies/92beabe3_5f4d_4d6d_840a_23e06daf5062/Industrial_policy2005.pdf)

Moazzem, K.G., Khandker, A., Arifuzzaman, M., & Ferdows, F., 2019, *New Dynamics in Bangladesh's Apparels Enterprises: Perspectives on Restructuring, Upgradation, and Compliance Assurance*, Center for Policy Dialogue, Dhaka, viewed 05 December 2020, from [https://www.researchgate.net/publication/337312917\\_New\\_Dynamics\\_in\\_Bangladesh%27s\\_Apparels\\_Enterprises\\_Perspectives\\_on\\_Upgradation\\_Restructuring\\_and\\_Compliance\\_Assurance](https://www.researchgate.net/publication/337312917_New_Dynamics_in_Bangladesh%27s_Apparels_Enterprises_Perspectives_on_Upgradation_Restructuring_and_Compliance_Assurance)

Moazzem, K.G. & Radia, M.A., 2018, *Data Universe of Bangladesh's RMG Enterprises*, 123, Center for Policy Dialogue (CPD), Dhaka, viewed 08 December 2020, from <https://cpd.org.bd/wp-content/uploads/2019/01/CPD-Working-Paper-123-Data-Universe%20%80%99-of-Bangladesh%20%80%99s-RMG-Enterprises.pdf>

Rahman, M.H. and Siddiqui, S.A., 2015, 'Female RMG Worker: Economic Contribution in Bangladesh', *International Journal of Scientific and Research Publications*, 5 (9), 1-9, viewed 08 December 2020, from <http://www.ijsrp.org/research-paper-0915/ijsrp-p4579.pdf>

Raihan, S & Bidisha, S. H., 2018, Female Employment Stagnation in Bangladesh, The Asia Foundation, viewed 06 December 2020, from [https://asiafoundation.org/wp-content/uploads/2018/12/EDIG-Female-employment-stagnation-in-Bangladesh\\_report.pdf](https://asiafoundation.org/wp-content/uploads/2018/12/EDIG-Female-employment-stagnation-in-Bangladesh_report.pdf)

'Remediation Financing in Bangladesh's Ready Made Garment Sector: An Overview', 2016, *International Labour Organization (ILO) & International Finance Corporation (IFC)*, viewed 05 December 2020, from [https://www.ifc.org/wps/wcm/connect/5f71d1f2-b05f-467b-9c75-0b0fc206456b/Report\\_Remediation+Financing.pdf?MOD=AJPERES&CVID=lpJnoLV](https://www.ifc.org/wps/wcm/connect/5f71d1f2-b05f-467b-9c75-0b0fc206456b/Report_Remediation+Financing.pdf?MOD=AJPERES&CVID=lpJnoLV)

Shadat, W.B., Rahman, M.T., Rahman, K.M., & Hawladar, A., 2016, *Cost Benefit Analysis of RMG Compliance to Increasing Presence of Ready Made Garments (RMG) and New Specialized RMG Industry Zone*, Copenhagen Consensus Center, viewed 01 December 2020, from [https://www.copenhagenconsensus.com/sites/default/files/bin\\_shadat\\_rmg.pdf](https://www.copenhagenconsensus.com/sites/default/files/bin_shadat_rmg.pdf)

Siddiqi, H.G.A., 2004, *The Ready Made Garment Industry in Bangladesh*, The University Press Limited, Dhaka.

South Asian Network on Economic Modeling (SANEM), 2019, *Baseline Study: Improving Working Conditions in the Bangladesh Ready Made Garment Sector*, International Labor Organization (ILO), Dhaka, viewed 04 December 2020, from [https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---ilo-dhaka/documents/publication/wcms\\_735614.pdf](https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---ilo-dhaka/documents/publication/wcms_735614.pdf)