International Network for Transport and Accessibility in Low Income Communities

INTALInC

Report by INTALInC

Transport and Social Exclusion in Bangladesh

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Acronyms

International Network for Transport and Accessibility in Low-income Communities' (INTALINC)

Dhaka Transport Coordination Authority (DTCA)

Asian Development Bank (ADB)

Chittagong Hill Tracts (CHT)

International Monetary Fund (IMF)

Ready Made Garments (RMG)

Dhaka City Corporation (DCC)

Dhaka Metropolitan Area (DMA)

Bangladesh Bureau of Statistics (BBS)

Household Income and Economic Survey (HIES)

Millennium Development Goal (MDG)

National Integrated Multimodal Transport Policy (NIMTP)

National Transport Plan (NTP)

Strategic Transport Plan (STP)

Revised Strategic Transport Plan (RSTP)

Clean Air and Sustainable Energy Project (CASE)

Bus Rapid Transit (BRT)

Greater Dhaka Sustainable Urban Corridor Plan (GDSUTCP)

Executive Summary

Bangladesh, located in South Asia, shares land borders with India to the West, East and North, and with Myanmar to the South-East. Even though Bangladesh does not share its land border with Nepal, Bhutan and China, they are also neighbouring countries of Bangladesh. After the civil war in 1971, Bangladesh was separated from Pakistan and became an independent country. Being only 47 years old, Bangladesh is young compared to its neighbouring countries. With a density of 1,278 person/km^2, it is considered as the eighth most populous country of the world. About 20% of the total population falls into the age range 25 to 54, which is considered to be the most productive.

Throughout its history, the country has faced weak governance and infrastructure is poor compared with developed countries. Despite the structural deficiencies, Bangladesh has achieved significant social and economic development – more than 7% GDP. Bangladesh has graduated from one of the least developed to a lower middle income country. To ensure the continued economic growth and sustain the development achieved so far, there has been a huge demand for an adequate energy supply and a modern transport sector.

Dhaka, the capital of Bangladesh and one of the densest cities in the world, currently accommodates about 9.3 million people. Like most of other cities in Dhaka, the male to female ratio is 1:1. Being the main commercial centre of Bangladesh, Dhaka is the hub of employment opportunities and also of all essential amenities, such as health, education etc. It accounts for about 35% of country's total GDP. However, the employed population has significant discrepancy with respect to gender. Even though both men and women are contributing in country's economic development, there is serious inequity in the availability of efficient and safe transport for female commuters. Sustainable urban development cannot be achieved unless women's and girls' safety, comfort, convenience and affordability are ensured.

Key transport issues for all of Dhaka's commuters are the inadequate balance between supply and demand, the inadequate and inefficient road network and public transport system, and a lack of coordination among the organisations involved in the transport sector in Dhaka. Additionally, female commuters have specific difficulties while using roads. Due to financial constraints, low income female commuters (mainly garment and domestic workers) are the most vulnerable commuter group. Most of the time they cannot afford any efficient transport

and are forced to walk on roads in poor condition. Middle income female commuters can afford to travel by bus, rickshaw or three wheeler auto-rickshaw (CNG). Due to bad conditions on the buses, a lack of bus stops, long waiting times and harassment from the bus drivers and co-passengers, bus travel is unsatisfactory for female commuters. Excessive fares and the unavailability of rickshaws and CNG are also significant transport issues for female commuters. High income female commuters have more independence than other women. However, due to social customs, female car and motorcycle drivers are uncommon in Bangladesh. Out of all these issues, physical and mental assaults are the most significant transport problems faced by female road users. The secure mobility of these women - who are contributing productively to the city and country's economy - has not been ensured due to an inadequate research focus and inattention to this area. Therefore, women's access to the employment opportunities are not being fulfilled and their dignity is being hampered.

The workshop with women slum dwellers, as part of this project, provided the opportunity to explore the travel behaviour of low income female commuters. Even though low income women commuters face obstacles, such as bad road conditions, absence of safety and security on road, physical stress from long walking distances, they do not use any mode of transport as that is a luxury for them. They would rather save money for their families or spend on their children's travel rather than on their own transport. Due to the financial constraints they cannot live far from their places of work or upgrade their lifestyle, and are unable to choose better employment opportunities further away from home.

The report explores the following findings from the case studies:

- Low income women commuters have limited affordability to spend on their transport;
- Low income women commuters live near their work place;
- To avoid risk low income women commuters travel in a group while commuting to and from their work place;
- Low income women commuters' perception of safety changes with change of time of day;
- There is no transport equity on the roads - middle or high income women commuters would not willingly choose to walk due to poor road conditions. However, low income women commuters are captive walkers and they have no choice;

- Overall women commuters are more vulnerable than male commuters. Increased travel costs, journey and waiting times lead male commuters to switch to other, more expensive modes. However, women tend to switch to walking. This is mainly because women have lower incomes than men but also because women consider their own comfort to be a low priority, preferring to spend money on their families;
- Female commuters are challenged by unfriendly situations on the bus - overcrowding, lack of seating, and high fares relative to service and travel distances, and other passengers' and drivers' bad attitudes towards them;
- As a short-term solution, a women only bus service can be provided.

Women's dignity of travel is a social matter that must be addressed through policy change and awareness campaigns offering proper education. Investigating policy change and education for ensuring female commuters' dignity of travel would be a further research avenue. Some transport plans, policies and studies of these issues in Dhaka are already available. However, it is important to understand whether these policies are enough to combat the mobility issues of vulnerable female commuter groups.

Introduction

This country report is the final document of the second workshop **'Transport and Mobilities: Meeting the Needs of Working Women'** that was held in Dhaka on 19 – 20 August 2017 at the University of Asia Pacific, Bangladesh funded by the GCRF project 'International Network for Transport and Accessibility in Low-income Communities' (INTALINC). The workshop focused specifically on women's transport needs, bringing together on one collaborative platform academic researchers from the nine INTALInC partner universities with four universities in Dhaka, Government officials of Dhaka Transport Coordination Authority (DTCA), Non-Government Organisations, Asian Development Bank (ADB), World Bank and researchers working on this topic.

The workshop involved a series of presentations by academic staff from the University of Asia Pacific (Bangladesh), Bangladesh University of Engineering and Technology, Shahjalal University of Science and Technology (Bangladesh), University of Aberdeen (UK) and University of Leeds (UK) and by non-academic experts from ARK foundation and Work for a Better Bangladesh. This led to extensive discussion around the research gaps focused on the needs of women in Dhaka. Practical fieldwork was central to the workshop agenda and participants took part in two field trips:

- Observing and experiencing an Auto-Rickshaw CNG ride; and
- Observing women's issues at a bus stop.

This report starts with a general overview of Bangladesh, later discussing the reason for choosing Dhaka as a case study city and women as a vulnerable commuter group in Dhaka. Available transport plans, policies and studies have been reviewed to understand whether female issues have been addressed. As part of INTALInC program, the authors of this report facilitated two extended workshops with low income women commuters and this report covers their findings. This report concludes with several case studies by different researchers working in a similar area. Overall this report is the groundwork for future research and for contributing knowledge to the field of women's mobility issues.

Country Overview

Bangladesh, located in South Asia, shares land borders with India to the West, East and North, and with Myanmar to the South-East. Even though Bangladesh does not share its land border with Nepal, Bhutan and China, they are considered to be neighbouring countries. Figure 1 illustrates the location of Bangladesh. After the civil war in 1971, Bangladesh, formerly known as East Pakistan, was separated from Pakistan and became an independent country. At only 47 years old, Bangladesh is younger than its neighbours.

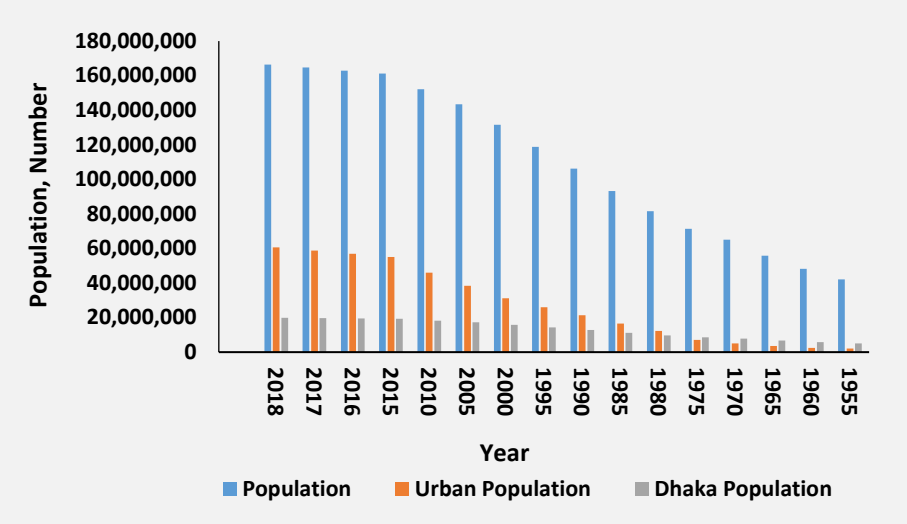
Source: World Atlas (2016

Figure 1 Location of Bangladesh

Population of Bangladesh

With a population density 1278 person/km^2, Bangladesh is the eighth most populous country in the world. Figure 2 illustrates the trend of population growth of Bangladesh, its urban areas, and Dhaka between 1950 and 2018. It shows that the overall population, as well as the urban population is growing in Bangladesh. Dhaka's population is also steadily increasing. Almost half of the total urban population lives in Dhaka (Figure 2). According to Hoque & Hossain (2005) and Niger (2011), Dhaka covers only one percent of the total land area. As

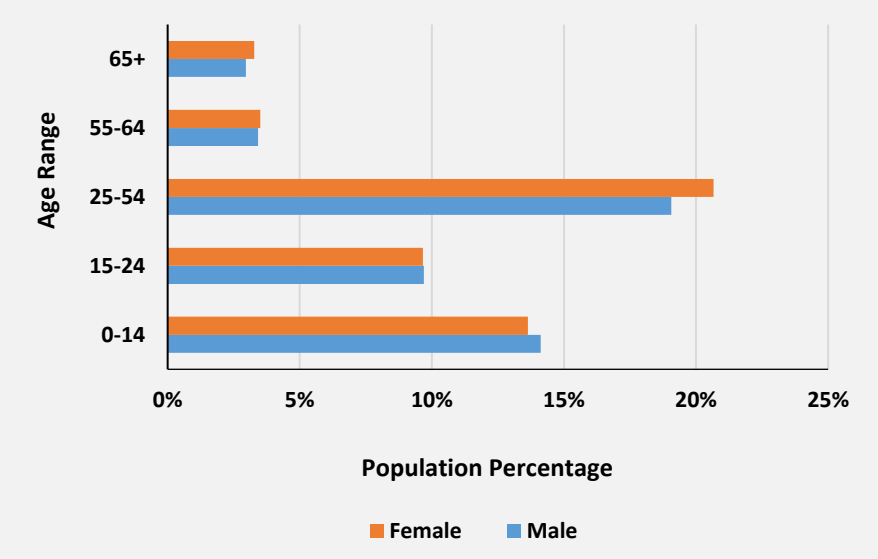
Figure 2 shows, this 1% of land area accommodates 35% percent of the total urban population and 12% of the total population of Bangladesh (Bangladesh Government, 2017).



Source: United Nation (2018)

Figure 2 Comparison of Dhaka's population with the total population of Bangladesh and total urban population of Bangladesh

Figure 3 illustrates the distribution of age range in the population. The figure shows that a significant proportion of the population is concentrated in the age range of 25 to 54. About 20% of all men and women fall into this age range, considered to be the most productive group.



Source: Central Inteligence Agency (2018)

Figure 3 Distribution of Age Range of Population by Gender

Bangladesh is a homogeneous country, the majority being Bengali (about 98%) and Muslim. The remainder are primarily indigenous (or 'tribal') peoples from approximately 54 different ethnic groups who mostly reside in northern Bangladesh or in the Chittagong Hill Tracts (CHT) in the southeast Bangladesh (Australian Government, 2018). Other than Islam, there are Hindu, Christian and Buddhist groups. Even though Islam is the state religion, the Constitution of Bangladesh upholds secularism, not granting political status in favour of any religion, prohibiting the abuse of religion for political purposes, and by prohibiting discrimination or persecution on religious grounds.

Economic Conditions

Political instability and a dominant military regime over several years disrupted the country's economic and sustainable development. After elections, the defeated party typically argues that the process was neither free nor fair. This has a tendency to create political instability, for example through industrial action and the boycott of parliamentary sessions. Industrial action and associated civil unrest can disrupt people from going about their daily business and limit the provision of essential services such as buses. Natural calamity is another significant obstacle for Bangladesh in achieving economic and sustainable development. Fortunately, in spite of all obstacles, Bangladesh GDP for FY2017-18 indicated an expansion of the economy, with a growth of 7.65% in real term as compared to 7.28% (final estimate) in FY2016-17. Figure 4 illustrates the GDP growth rate of Bangladesh. As compared to FY 2016-

17, the higher GDP growth in FY2017-18 is mainly due to increase of growth in the agricultural, manufacturing, power and utilities, construction, trade and public administration and defence sectors.

Source: Bangladesh Government, Bangladesh Bureaue of Statistics (2017)

Figure 4 GDP Growth Rate of Bangladesh

The World Bank classifies Bangladesh as a lower middle-income country. Bangladesh ranked 139th out of 188 countries on the 2016 UN Human Development Index. According to the International Monetary Fund (IMF), Bangladesh's economy was the second fastest growing major economy of 2016 (Dec), with 7.11% GDP growth rate increasing from 6.55% in 2015 (Figure 4). Sustained economic growth has enabled the country to reduce extreme poverty from 44.2% living on less than US $1.90 per day in 1991 to 18.5% 2010. By 2016 this percentage had decreased 12.9%, or 20 million people (Australian Government, 2018).

Industry's contribution to GDP was 28.1%, and the Ready Made Garments sector contribute the lion's share (Akter, 2017). Since 2004, Bangladesh has averaged a GDP growth rate of 6.5%, driven by its exports of readymade garments. (Bangladesh Garment Manufacturers and Exporters Association (BGMEA), 2015). Table 1 lists the share of RMG in country's GDP.

Table 1 Year to Year Share of RMG in Country's GDP

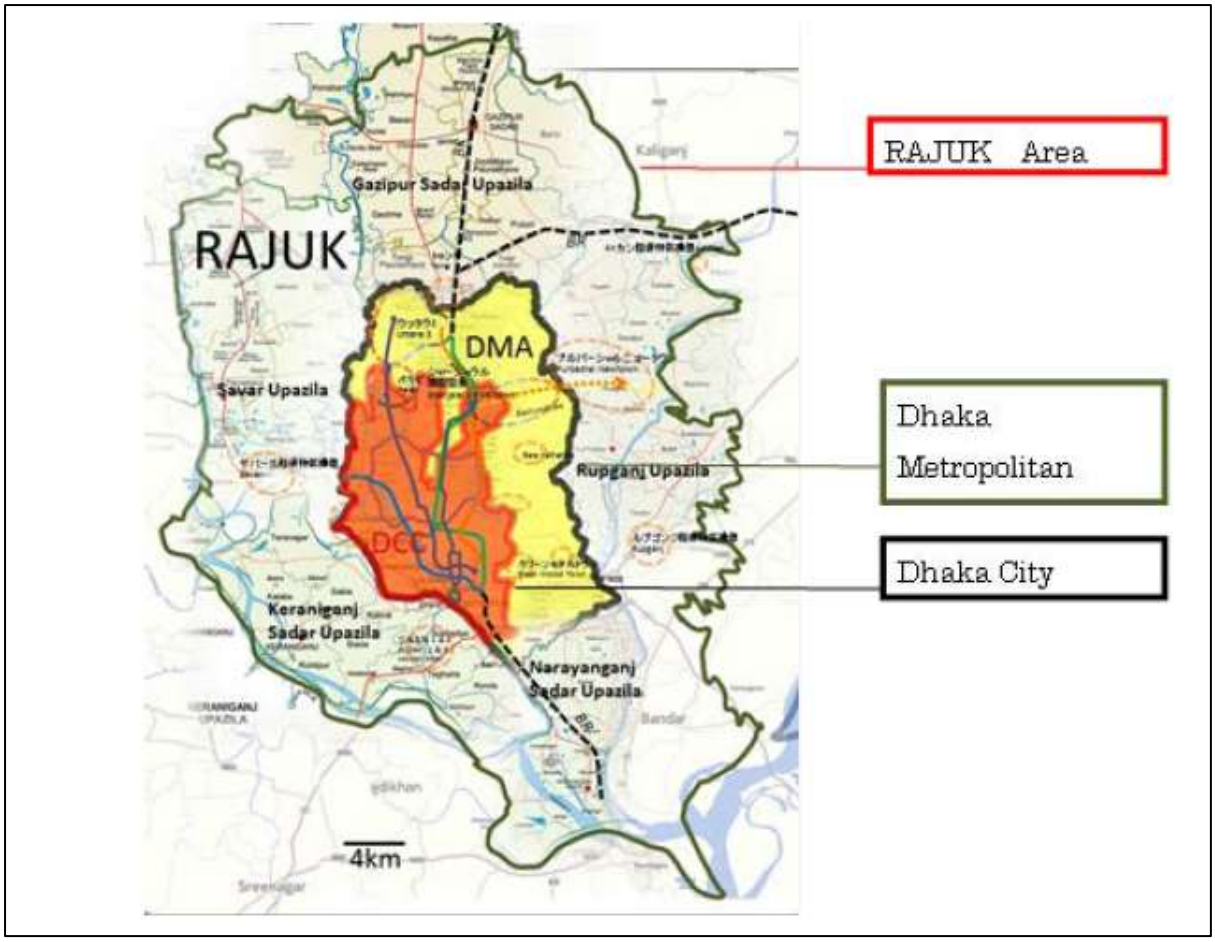
Year	Share of GDP (%)
1994-95	5.87
1999-00	9.24
2004-05	10.63
2009-10	12.45
2013-14	14.07

Source: BGMEA (2015)

This economic growth has increased the demand for energy and transport. To sustain its levels of growth, the World Bank recommends that Bangladesh urgently implements structural reforms, expands investment in human capital, increases female labour force participation, and raises productivity through improved global value chain integration (Australian Government, 2018).

Why Dhaka and Why Female?

Dhaka is divided into three tiers, Dhaka City Corporation (DCC) area, Dhaka Metropolitan Area (DMA) and Greater Dhaka Area (GDA). Dhaka (including the DCC area and DMA) is under the jurisdiction of capital City Authority (RAJUK). DCC currently accommodates about 9.3 million people (Bangladesh Bureau of Statistics, 2015). Figure 5 illustrates the location of DCC, DMA and GDA. DCC is one of the densest cities in the world. DCC has an area of 360 km^2 and a population density of 23,234/km^2 (Hossain, 2004; BBS, 2010).



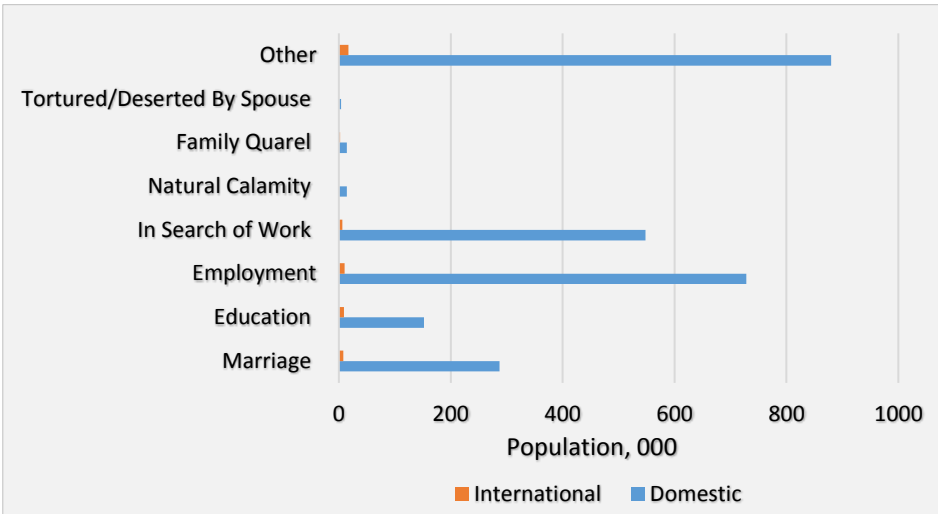
Source: Almec Corporation, Oriental Consultants Global, & Katahira & Engineers International (2015)

Figure 5 Location of DCC, DMA and Rajuk Area or Greater Dhaka

Dhaka contributes approximately 35% of country's total GDP (Cambridge Centre for Risk Studies, 2015). The main commercial centre of Bangladesh, Dhaka offers lots of income generating opportunities and is the main centre of employment. Dhaka is also the hub of other urban amenities, such as education, medical care etc. Therefore, the reason for population growth in Dhaka is not only birth rate but the significant influx of immigrants from other cities and villages.

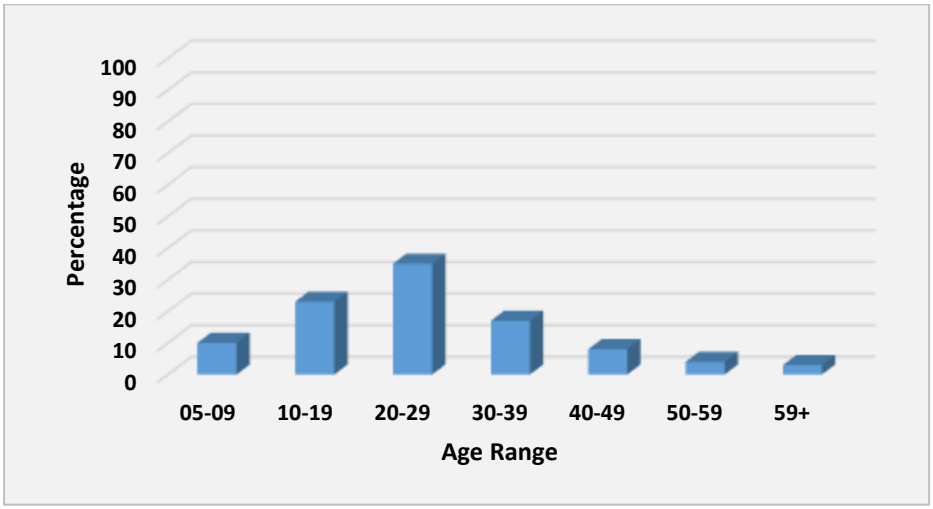
Figure 6 illustrates some of the significant reasons for domestic and international migration to Dhaka. 'Employment' and 'In search of work' are the main reasons of internal migration. While migrants in 'Others' are those who came for medical treatment, as a result of political anxiety or with no clear purpose. Most of these migrants (about 90%) are less than 40 years of age and around 70% are less than 30 years of age (Figure 7). This data clearly indicates that

the younger generation are more attracted to migration due to Dhaka's economic importance.



Source: Bangladesh Bureau of Statistics (2011)

Figure 6 Number of In-Migrants to Dhaka (by Purpose)

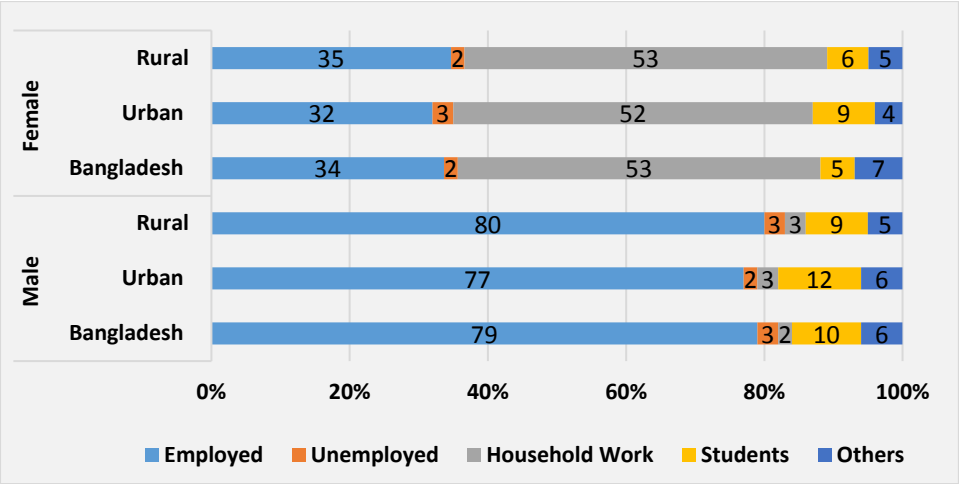


Source: Bangladesh Bureau of Statistics (2011)

Figure 7 Migrants Composition by Age Group

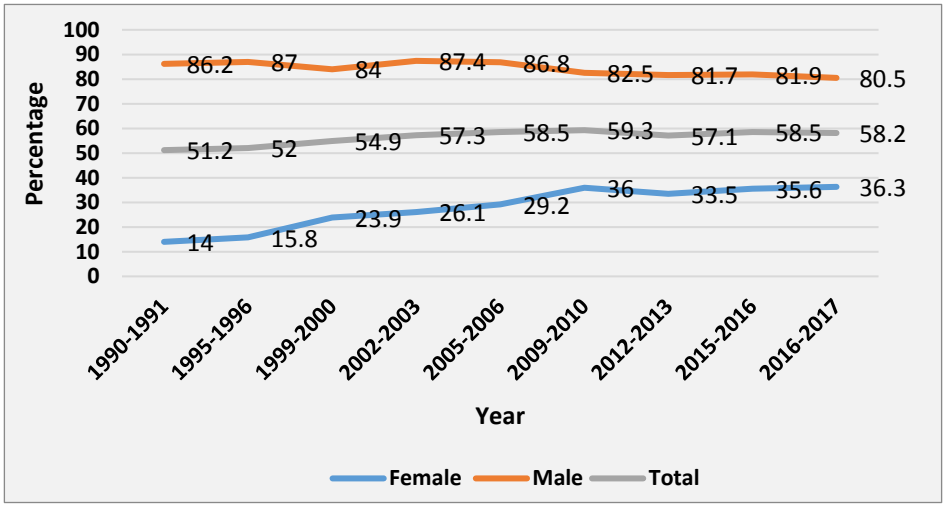
As stated earlier, about 50% of Bangladesh's population are women. However, there is a significant discrepancy in the gender makeup of the employed population, and Dhaka reflects the same scenario. According to the labour force survey in Bangladesh about 40% of labour

force is represented by women. Figure 8 illustrates the social status of the working age (+15 years) population in Bangladesh, urban and rural areas. Mostly women are involved in unpaid household activities. However, according to Bangladesh Bureau of Statistics (BBS), the percentage of female employment has grown almost three times in size since the year 1990 (Figure 9).



Source: Bangladesh Government, Labour and Employment (2010)

Figure 8 Social Status of Working Age (15+) Population in Bangladesh



Source: Shefali (2000); Bangladesh Government, Labour and Employment, 2010; Bangladesh Government, Bangladesh Bureaue of Statistics, 2006; Bangladesh Government, Labour and Employment, 2013; Bangladesh Government, Labour and Employment, 2016)

Figure 9 Increasing Trend of Female Participation in Labour Force

Women are contributing significantly for country's economic development. About 5,100 garment factories are situated in Bangladesh employing 10 million workers directly or indirectly of whom about 85% are women (BGMEA, 2015; Islam and Zahid, 2012). Among these garment factories large percentages are located in Dhaka and along the periphery of Dhaka. It is definite that with 90% female, labour intensive export-oriented industries are mainly run by female workers. Women are also involved in other sectors as well such as agricultural, manufacturing, construction etc. A significant percentages of women involved in informal job as domestic workers. Of course, large number of women also working without pay in their household chore. Table 2 lists the statistics of male and female share of formal and informal employment. Statistics shows that significant percentages of female are involved in informal employment. Safe and efficient transport is the essential element for women to participate in the work force.

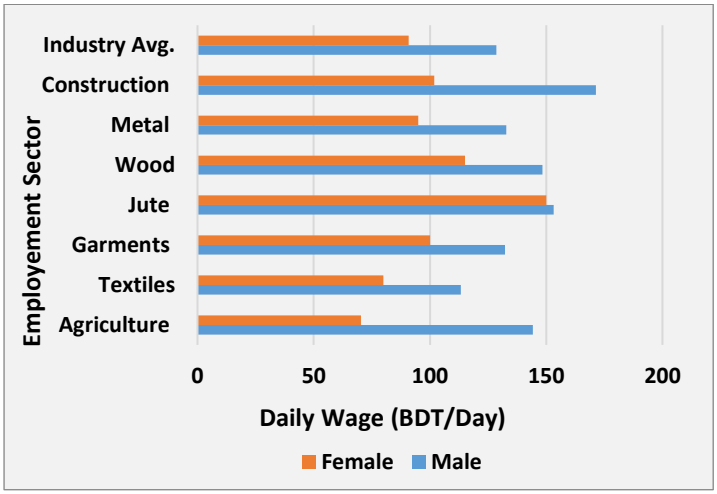
Table 2 Distribution of Employed Labour Force by Gender and Sector

Year	Type of Employment	Male		Female	
		Number ('000s)	Percentage %	Number ('000s)	Percentage
2000	Formal	8420	27.1	1230	15.6
	Informal	22669	78.9	6660	84.4
2006	Formal	8594	23.8	1614	14.3
	Informal	27486	76.2	9663	85.7
2010	Formal	5542	14.6	1244	7.7
	Informal	32391	85.5	14959	92.3

Source: Bangladesh Government, Labour Force Survey (2006, 2010)

Unfortunately, even though female employment is increasing daily, women earn lower wages and salaries than men working in the same sector. Figure 10 illustrates the difference in wages and salaries between men and women working in different sectors. Table 3 compares male and female wages and salaries. Household Income and Economic Survey (HIES) data shows that the female to male ratio for the monthly pay of salaried employees is much lower than

the ratio of daily wages. Therefore, females from the middle income range also considerably discriminated against with respect to pay.



Source: Bangladesh Government, Bangladesh - Household Income and Expenditure Survey (2010)

Figure 10 Daily Wage Difference of Male and Female Workers in Bangladesh

Table 3 Average Wage and Salary for Men and Women, 2010

Gender	Wage	Salary
Male	169.3	18154.7
Female	142.9	9762.1
Female/Male	0.84	0.54

Source: Bangladesh Government, Bangladesh - Household Income and Expenditure Survey (2010)

Bangladesh is working hard to address its gender gap. According to the Global Gender Gap Report (2017), Bangladesh is ahead of neighbouring countries, such as India, Pakistan and Myanmar attaining a ranking of 47 (World Economic Forum, 2017). Bangladesh has achieved UNDP's Millennium Development Goal (MDG): *promoting gender equality and empowering women* by increasing the country's net enrolment rate at the primary school level from 80% in 2000 to more than 90% in 2015 (Banerji, 2017; United Nation Development Program, 2015). Female enrolment in primary and secondary school has increased.

Even though Bangladesh achieved significant success in female education and employment, for sustainable urban development, it has a long way to go to ensure women's and girls' safety, comfort, convenience and ability to pay for urban transport. Inefficient and unreliable

urban public transport imposes a burden on women. Where the public transport system is unreliable and unaffordable, women do not choose better employment opportunities, rather they prefer lower-paid local opportunities (Asian Development Bank, 2011). This is made worse by the chaotic nature of traffic organisation (Figure 11) across Dhaka as a whole, as well as extremely poor walking environments. Safe, comfortable, convenient and affordable transport can play an important role in meeting women's basic needs such as access to school, markets etc., but also contributes to female empowerment.

Source: Noman & Khan (2015)

Figure 11 Traffic Congestion in Dhaka

Dhaka's commuters use different modes, such as bus, rickshaw, auto-rickshaw (CNG) and car for their commute. According to its Strategic Transport Plan, Dhaka's modal share is dominated by non-motorised transport (walking 14% and rickshaw 34%) and public transport (44%) (The Louis Berger Group & Bangladesh Consultants Ltd., 2005). Dhaka's transportation system is road based, and only around seven % of land is dedicated to transport infrastructure (Chowdhury, 2014). Key transport issues for Dhaka commuters in general are the inadequate balance between supply and demand, the inadequate and inefficient road network and public transport system, and a lack of coordination among the organisations involved in the transport sector in Dhaka.

Furthermore, the drawbacks of Dhaka's congested roads include excessive travel times for all modes, overcrowded buses, unhealthy conditions on buses, long waiting times, unreliability, lack of safety and security. In the case of working women, the situation is made far worse by the abuse of female passengers by male passengers, and by drivers and helpers (Nasrin, 2015). Another study by the BRAC revealed that 94% of women commuting on public

transport in Bangladesh have experienced verbal, physical or another form of sexual harassment (BRAC, 2018). The same study also revealed that in about 66% cases these incidents were perpetrated by males between 41-60 years old (BRAC, 2018). Furthermore, as part of a patriarchal society, girls and women in Dhaka do not feel comfortable riding on overcrowded buses. They experience cultural constraints to proper access to public transport because of social seclusion, the seclusion of women from men (Peter, 2013). Social seclusion defines separate places for men and women (Shefali, 2000). Women themselves want separation from men on the buses. Also, because of their cultural attitudes and natural inclination, women cannot defend themselves from coarse misbehaviour or physical touching on public transport most of the time, which leads them to confine their mobility (Mannan & Ahmed, 2014). According to Shefali (2000), the inability of the existing transport system to address the specific needs of women places additional constraints on their mobility.

Females from low income groups face the most difficult situations. According to the Bangladesh Bureau of Statistics, low income groups are defined as those who have incomes of less than 5000 BDT (about 60 USD) per month (Bangladesh Government, 2016). Even though pedestrian facilities and infrastructures are negligible in Dhaka, people in the lower income range predominately walk to meet all their mobility and accessibility needs (Figures 12 and 13) (Shumi, et al., 2015; Nasrin, et al. 2012). Female garment workers, about 90% of whom earn the minimum wage (about 40 USD), have started to migrate to Dhaka where the majority of the factories are located (Shumi, et al., 2015). But the secure mobility of these women - who are contributing productively to the city and country's economy - has not been ensured due to an inadequate research focus and inattention to this topic area. They experience a particular feeling of insecurity which can restrict their "*Access to Opportunities*" and eventually, undermine their *"Right to the City"* (Lefebvre, 1995).

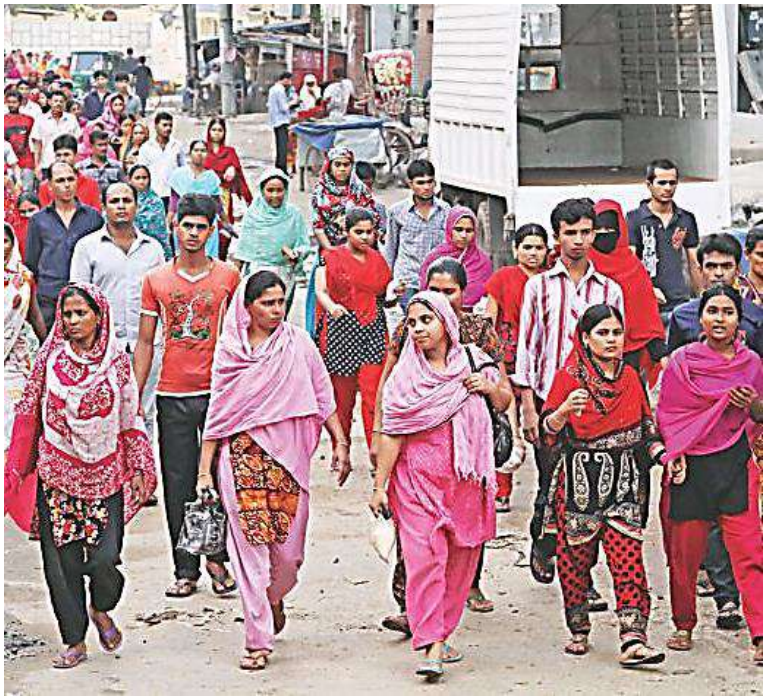


Figure 12 Low Income Female Workers Walking to their Work Place

Source: (Ahsan, 2012)

Figure 13 Women Crossing Road Unsafely in Dhaka

Although middle income female commuters can afford to spend more on transport services than lower income groups, their main mode of transport is still the bus. However, inefficient bus systems, combined with the discriminatory and abusive attitudes of their male co-passengers and male bus drivers and conductors, make the in-bus journey experiences highly

insecure and sometimes life-threatening for female passengers. Islam et al (2016) state that harassment towards women can be both psychological (verbal and non-verbal, such as leered or starred by other co-passengers) and physical. In the last five years, there have been two widely publicised occurrences of gang rapes of women travelling by public transport at night (Daily Star 2017). Women are also harassed on a day to day level. The frustration is reflected by a female bus user stating "If you are a female passenger then you will face numerous problems and a female passenger means anyone can touch her in an inappropriate way" (Daily Star, 2015). The Daily Sun reported another incident of psychological and physical harassment of a girl traveling by night coach on Dhaka-Thakurgaon route (Daily Star, 23rd January 2017). Figure 14 illustrates a woman trying to enter into an over-crowded bus in Dhaka.

Figure 14 Women trying to Board into the Overcrowded Bus

Female commuters who have the financial means to do so choose better and more expensive private modes of transport, which can give them a greater sense of security and comfort. High income female commuters can afford to own private vehicles. However, it is very rare to see female drivers on Dhaka's roads. Dhaka's conservative society and patriarchal culture does not usually allow female commuters to drive, cycle or ride their own motorbikes. According to the (Akhter, 2017) a female rider, seeking anonymity, said she faced a rather unusual and bitter experience at Mohammadpur when a traffic police officer stopped her and asked why she was riding because it is not acceptable in society.

Figure 15 Women Motorcycle Drivers

It is undeniable that these important transport and mobility issues are a major obstacle to the fulfilment of SDGs for Bangladesh. Female commuter groups from different income ranges experience the worst effects of these problems, although often those on the lowest incomes are the hardest hit. However, very seldom have the mobility environments of female commuters been given attention by transport policymakers funders of new transport projects in Dhaka and other Bangladesh cities. Most of Bangladesh's transport budget is spent on constructing new infrastructures, such as bridges and roads for the minority of car users in the population. One recent exception is the new Bus Rapid Transit (BRT) project, which has identified female barriers to mobility, and, as such, it can be anticipated that the final BRT policy they will consider women within the design of the project. In the next section, the Gender Action Plan for BRT is discussed briefly. However, BRT will provide services to only a very limited part of Dhaka, and will not serve the majority of the city's local population. Therefore, the majority of low income groups will be left insecure in the urban mobility space. All these issues signal an urgent need to focus on solutions to address the mobility needs and concerns of working women in Dhaka.

Overview of Transport Policy, Plan and Study for Dhaka

National Integrated Multimodal Transport Policy (NIMTP)

The National Integrated Multimodal Transport Policy (NIMTP) 2013 was approved by the Government on 26th August 2013. The purpose of NIMTP is to achieve a wider dissemination of the Policy, particularly amongst the international community involved in the multimodal transport sector in Bangladesh. The intention of this policy was to ensure the equal

importance of inland water transport, railways and air transportation along with road transport. All sectors are mentioned separately in the policy. Importance has also been placed on road safety. ***The policy refers to the 'Pedestrian First' program, which is aims to remove unauthorized encroachment from footpaths in urban areas.*** Special emphasis is given to ***separate bicycle and non-motorized transport lanes***. The policy also states that labour-intensive methods in the construction and maintenance of transport projects will be encouraged where appropriate. ***Social equity has been addressed by mentioning that transport facilities and services will, in future, be designed considering the special needs of women, children, elderly and physically challenged people. However, no specific indication as to how this will be achieved is provided.***

The policy objectives and policy emphasis are as follows (Almec Corporation, Oriental Consultants Global, & Katahira & Engineers International, 2015):

Policy Objective:

- Reduce cost of transport goods to make goods and services within Bangladesh less costly;
- Aid export competitive, through lower transport costs;
- Improve safety;
- Reduce accident rate;
- Take advantages of Bangladesh's geographical position to trade in transport services and induce efficiency in transport sector;
- Reduce the worst environmental effects of transport;
- Ensure that transport meets social needs in terms of cost accessibility to all sectors of society;
- Improve integration of the overall transport network and foster measures to make interchange between modes easier;
- Reduce the need for travel by better land use planning;
- Use transport as means to assist poverty reduction;
- Improve fuel and energy security; and
- Increase alternative options for passenger and freight transport.

Policy Emphasis

- Adopting strategies for integrated transport policy;
- Ensuring best utilization and maintenance of existing assets and infrastructure;
- Encouraging more investment in rail and inland water transport;
- Adopting integrated and interchange between modes of transport;
- Improving regional connectivity;
- Fostering the role of multimodal transport operators (MTOs);
- Setting specific targets for improving air quality, road safety, public transport provision and efficiency, and road traffic growth reduction;
- A firm commitment from the government to provide adequate levels of funding;
- Greater private sector participation in the sector;
- Upgrading traffic management;
- Innovative funding mechanisms, including road user charging and levies to fund road maintenance and proper and efficient use of Road Fund;
- Establishing rational tariff for international traffic to ensure quality service in regional connectivity;
- Ensuring physical and operational integration between different modes of transport;
- Establishing a more rational regulatory framework;
- New coordinating mechanisms to advise on integration at the national level and act as a force for change;
- Meeting the transport needs of women and girl-children;
- Applying digital technology in the management of integrated transport policy
- Improved research, education, training and technology to support integrated transport objectives.
- Limiting damage of roads through enforcement at axle load control stations on highways;
- Modernizing dry ports to enhance efficiency in the management of freight and passenger movement; and
- Bringing navigability of rivers through enforcement, removing encroachment of river banks, permanent stopping of river pollution, upgrading of river ports and ensuring an environment conducive to transportation through river ports.

National Transport Plan (NTP)

The National Transport Plan is a long term vision covering at least 30 years, aiming to make the role of transport in economic activities more significant and underpin continued economic and social development.

According to National Land Transport policy, (2004) objectives of NTP are as follows:

Plan Objectives:-

- To provide a safe and dependable transport service;
- Removal of unnecessary control and formulation of laws and regulations conducive to providing service;
- Government will preserve the right ***to regulate fares to protect the interests of the common man***. But Government, if needed, will arrange for subsidies if there is a discrepancy between the cost of operation and revenues;
- To maintain an economic and environmental balance the investment environment will be improved to attract private entrepreneurs. Roads will be constructed with appropriate designs, and the operation of vehicles will be controlled to minimise adverse effects on the environment. Compared to rail and water transport, the pressure on road transport is gradually increasing, but there is a need for intervention in the policy to encourage the use of rail and water transport, as they are comparatively more environment friendly;
- Reduction of transport cost of goods for export. An unrestricted and integrated transport system is essential for trade;
- Formulation of transport system for Dhaka city (Greater Dhaka). Provision will be made for a transport system suitable for working people in Dhaka city which will eliminate traffic jams, control environmental pollution, have modern traffic system, with provision of high capacity vehicles, fly-overs, elevated expressways, etc.;
- An integrated transport system will be introduced integrating rail, bus, taxi and water services and terminals, to assist economical transport and ease of interchange;
- Government will encourage the introduction of alternative transport systems so that customers may choose the appropriate system according to their needs;

- Creating of awareness regarding better standard of life and safety: Greater awareness of better standards of safety in transport will be created. Works programme will be taken up in this policy to increase awareness regarding the subjects of housing system in urban planning, community transport system, safe walking for pedestrians, traffic training, etc.;
- One of the goals of this policy is poverty alleviation as policy said that The transport sector will be highlighted within the overall planning and programme of the **Government so that lower income groups also enjoy the fruits of development.**

Strategic Transport Plan (STP) and Revised Strategic Transport Plan (RSTP)

The Clean Air and Sustainable Energy Project (CASE) was funded by the World Bank to address air pollution at the source. The Strategic Transport Plan (STP), which is the most comprehensive transport study, was recommended by the CASE project (Bhuiyan, 2007).

STP (2005) serves as the current basis for urban transport planning in Dhaka. It considers aspects of multimodal transport, safety, pricing, environment, travel demand management and land use for improving the transport situation with a long-term vision. Previous planning studies, including Dhaka Integrated Transport Studies (DITS), Dhaka Urban Transport Plan (DUTP) and Dhaka Metropolitan Development Plan (DMDP), have been updated in the STP for proposing a long-term transport plan over a period spanning from 2004 to 2024. This study projected future growth by considering the planned land use presented in DMDP (The Louis Berger Group and Bangladesh Consultant Ltd, 2004). To update the plan and to continue the development of the transport system in Dhaka, a Revised Strategic Transport (RSTP) was approved in 2015 (RSTP, 2015).

According to the RSTP for Dhaka (2015) eight specific objectives are identified in the master plan:

- Promotion of social understanding about urban transport problems and issues
- Effective management of urban growth and development
- Promotion and development of attractive public transport
- Efficient traffic control and management
- Effective management of transport demand

- Comprehensive development of transport space and environment
- Enhancement of traffic safety and reduced environmental impacts
- Strengthening of urban transport administrative and management capacities

Greater Dhaka Sustainable Urban Corridor Plan (GDSUTCP)

As proposed in the STP a 20 km Bus Rapid Transit (BRT) corridor is being constructed from the international airport in Dhaka to Gazipur, connecting Gazipur City Corporation and Dhaka City Corporation. It is anticipated that about 20,000 passengers will travel in each direction per hour and travelling time will be reduced by about half. The Gazipur City Corporation (GCC) area is a garment hub, with 272 garment factories in the immediate vicinity of the corridors, employing approximately one million, mostly female workers. In the Greater Dhaka Sustainable Urban Corridor Plan women's issues have been directly mentioned:

- User friendly Fare Reregulation policy is one of the criteria mentioned in this plan. For garment workers and students, the fare is planned to reduce by half on the production of a valid identity card provided by the concerned organization/s.
- There will be separate queuing system for male and female passengers so that tickets are sold on an equitable basis.
- Gender friendly On Board Safety Rules will be set. Drivers will be educated about basic safety issues. On board, announcements will be made about bus service rules. In addition there will be female as well as male stewards/crew.
- User friendly, decorated foot over bridges (FOB) with roofs and lighting facilities in the underpasses near RMG industries will be provided.
- Police patrols, including female police, at FOB and bus stops will be increased to enhance road safety.
- Provision public toilets with adequate facility and privacy for men and women.
- Increased women worker's participation in road construction, maintenance.
- Employ female staff for BRT.
- Employ one male and one female staff at BRT Bus stations for peak hours and special days.
- Provide equal wage for equal work
- Provide water and sanitations facilities for female workers
- Keep provision of shops for women in BRT terminals

Are Female Issues Addressed in Transport Plan, Policy and Study?

As discussed previously social and financial constraints mean that female commuters are comparatively vulnerable compared to their male counterparts. Due to financial constraints most of the low income commuters tend to walk to their work places (Nasrin, 2015). Even though women are not mentioned specifically, the NIMTP, NTP, and RSTP state that travel costs should be affordable for all types of road users. The NIMTP states that subsidies should be given to those who are disadvantaged and poor. However, at present, there is no subsidy or discount for female commuters' travel. Inadequate alternative modal options also force low income female commuters to walk to reach their destination. However, walking conditions in Dhaka are very poor. In NTP and NIMT alternative transport provision has been emphasized. In the NIMTP and NTP it is stated that travel time should be consistent with the distance travelled.

Pedestrians face difficulty with narrow roads and generally bad conditions including flooded roads after rain. In the long run, these are the main reasons behind the lack of safety on roads. Female commuters face harassment while walking and as well as on buses. Newspapers report many incidents where women have been physically assaulted (Daily Sun, 2017; daily Star, 2015). Safety is addressed in the NIMTP, NTP, RSTP.

From previous research, it has been found that significant percentages of low income commuters walk to their work place even though they are not satisfied with the walking facility (Nasrin, 2015). However, none of the policies and plans directly mentioned improvements to walking facilities.

Most of the transport and infrastructure projects in Dhaka encourage a car based transport system, such as flyovers and the elevated expressway. According to RSTP several on-going projects under Dhaka City Corporation focus on pedestrian walk way improvement (RSTP, 2015). In March 2014, Dhaka North City Corporation (DNCC) inaugurated the construction of the first ever foot-over Bridge with an escalator (in the upward direction only) at the intersection of Banani Road Number 11 and Airport Road. DNCC has plans to construct seven more bridges of this type if the original construction is shown to make a positive improvement. In the long run these types of projects will help women commuters to walk freely and safely. Especially, those who are disabled (both men and women) or pregnant.

Workshop with Slum Dwellers

As a part of the INTALInC program, two workshops were arranged: one at Korail Slum and another at Geneva Camp. Details of workshops are discussed in this section.

Workshop 1: Mobility Issues of Low Income Women: Discussion with Korail Slum Dwellers

Location: Korail Slum, Gulshan, Dhaka

Date: June 5, 2018

Korail, one of the largest slums in Bangladesh, is surrounded by two of Dhaka's most luxurious neighbourhoods, Gulshan and Banani. It covers an area of approximately 100 acres and is home to more than 50,000 residents. It is located just opposite the BRAC Head Office in Mohakhali area, Dhaka and beside Gulshan-Banani Lake. In Korail, majority of people come from the poorest parts of Bangladesh. Most of the Korail slum inhabitants are living below the poverty line and working in low income jobs. Figure 1 illustrates the access road into the Korail Slum.

Figure 16 Korail Slum

Most of the female inhabitants of Korail work as maids in households in the surrounding areas. Some work in the RMG sector. At present, due to a lack of transportation facilities, residents of Korail, and especially women and children, face difficulties with their commute. Most people walk to reach their destination as there is no alternative, affordable transportation facility. However, the walking facilities are almost non-existent within the

slum area. Until recently, most of the women used a boat service that was available on Gulshan Lake. The boat fare was ranged between 2 BDT to 5 BDT. However, the government imposed a ban on boats in the lake for security reasons.

The workshops were arranged with two different groups in Korail slum: one with 20 household workers and the other one with 10 women working in the RMG.

The objective of the focus group discussion was to understand low income female commuters' travel behaviour. A detail discussion was had with them around their economic information, pattern of transportation use, problems relating to travel issues, whether they receive any support from Government or Non-Government Organizations (NGOs). They were also asked about their expectations for an improved mobility option.

Discussion with Household Women Workers:

The average income of household workers ranges from 3,000 to 4,000 BDT and their main mode of transportation is walking. They work in households/apartments nearby to their slum area. It takes about 30 minutes on foot to reach their work places around 3 to 5 kilometres away. They usually walk to catch the city buses should they need to use them. They have limited abilities to spend any extra money to meet their transport needs. Other available vehicles are rickshaws and CNGs but these modes are expensive and limited in number. As mentioned previously, there was boat service available which has been stopped due to a government intervention. This has led people to take different, longer routes to work. Ultimately the extra journey time hampers social and family life.

In terms of safety, the women feel safe within the slum area. In areas outside the slum area, such as near Banani Bridge, there is evidence of incidents of snatching, hijacking and eve teasing. The condition of the pathway which connects the slum to the surrounding area is inadequate. However, the slum dwellers have a limited perception of good quality roads and the women do not have significant objections to this despite the poor condition of the connecting pathway and lanes inside the slum. During the rainy season, due to the lack of a proper drainage system, water logging is a common phenomenon, which has further deteriorated due to rubbish discarded by the slum dwellers. Consequently, the lake's water level rises two to three feet during monsoon period, making use of the pathways impossible. Women and children are seriously affected by this. The situation is even worse as rickshaw

and CNG fares increase during these conditions. Waterborne diseases also spread out during these periods, increasing the vulnerability of the slum residents. In emergencies some special transport services are made available by NGOs.

Slum dwellers want the boat facility to resume. In cases of urgency, they could easily use boat service to travel to their work place. Traveling by boat to the surrounding area would save time and they could spend more time with their families and friends. The lower income women also expected transport provision to enable their children to attend school. They also mentioned that a proper transportation system would enhance their social and family life because of increased convenience and the time it would save.

Discussion with RMG Workers:

The average income of RMG workers in Korail ranges from 4,200-5,000 BDT. For this group main mode of transportation is walking and most of the time they travel to work on foot. Usually, they work in the garment factories near to their homes. Travel time to work is around 15 to 30 minutes. Most of the time they walk to work in small groups, mainly because it makes them feel more safe. They also share rickshaw rides with their co-workers though they can barely afford additional expense for transportation. There is no affordable public transport available to them. There is evidence of unwanted incidents (snatching, hijacking, eve teasing etc.) at some specific places such as Road 8, Road 9, Road 11 in Banani and near Banani Bridge. In cases such as medical emergencies some special support is available from NGOs. Similar to household workers, they also wanted to the boat facility in the area to resume – it was free from traffic congestion and saved time. This group also expected transportation for their children to travel to school.

The workshop with the low income working women in Korail reveals significant information regarding their transport use. Both the men and women usually have limited funds to travel to work. This is because almost all of their earnings are spent meeting their basic needs. Some dwellers might spend between 2 to 5 BDT per day. Most low income women who attended the workshop mentioned that they think using any non-pedestrian travel modes would be a luxury. Due to cultural circumstance women in Bangladesh would rather save this money for their family or spend on their child's travel to school, instead of spending it on themselves. They would however, be very interested in any transport facility provided free of charge.

Workshop 2: Mobility Issues of Low Income Women: Discussion with Geneva Camp Dwellers

Location: Geneva camp

Time: 24th of July and 27th of July, 2018

Geneva camp is located in the heart of Dhaka. It was set up by Red Cross in 1972 after the liberation of Bangladesh. With the exception of a few working-class Bengalis, most of the inhabitants of Geneva camp are ethnically Bihari. Over 3000 family live in Geneva camp. Originally, each family was given only one room and most have continued to live in their designated rooms since 1972 despite their increasing sizes. A typical room of 15 feet by 12 feet, often accommodates five to 10 people.

The land on which Geneva camp is built was owned by a private housing company, Liaquat Housing Society, before the war in 1971. It is one of the few Bihari camps where the land is still privately owned. Legally Liaquat Housing Society exists, though their absence means that no one else can take formal control of the land. The government declared the land as a site for a camp proposed by the International Committee of Red Cross (ICRC). There is no evidence of the government taking ownership of the land although they gave ICRC the permission to build the camp. No rent is paid to the Liaquat Housing Society. None of the camp's inhabitants own their land and the owner's absence allows these families rent free access to their rooms.

However, in recent years most of the original inhabitants built two or three story buildings on their land and some of which are now rented by other families. These rooms cost around 3,000 to 3,500 BGT in rent though they do not have private toilets. Renters mostly use the public toilets which have been built by NGOs. Each room comes with an electric connection and there is periodic access to running water. All of these utilities are free as the inhabitants still have refugee status.

The workshop sessions took place in one of the respondent's room. The first group, consisted of six women amongst whom four are housewives and two work outside the camp. Five of them live in a rented room and only one of them has her own place.

Over 40 minutes, it was revealed that a family of five needs at least 12,000 to 15,000 BGT a month to survive. Expenditure on rent, food, and school fees accounts for a significant

proportion of monthly earnings. Respondents also added that on the top of daily expenses they need to save for their uncertain future.

Most of the respondents have lived in the camp for the majority of their lives. One of them had lived in a different camp but moved into Geneva camp with her husband after she was married. One of the respondents, aged in her 70s, had seen the camp develop and grow while another, younger respondent who was less than twenty years old grew up and had only ever lived in the camp. The two generations shared their lived experiences together. Of this group, only two women work outside the home. One works in a garment factory in Syamoly, which is a 30 minute walk from her room while the second works for an NGO located inside the camp. The first woman works six days a week, from 8 am to 8 pm every day. She walks to her work half an hour earlier than her entry time and returns to her house at 9 pm at night. She gets an hour break for lunch at 1 pm but she does not come home and takes her lunch with her. The woman is the breadwinner in her family: her husband is unemployed and they have three children, including one under the age of six. She wakes up at 5 am every day to prepare breakfast and lunch and then goes out to work. Despite having a very young child, she cannot return home during her lunch hour because of time constraints. It takes 20 minutes to reach her workplace by foot and another 20 minutes for return. The woman and her family live hand to mouth and she added she cannot afford to use a rickshaw as it will cost to great a proportion of her monthly salary. The rickshaw costs 20 BGT one way which would equate to a monthly outlay of over 1,000 BGT from her 7,000 BGT salary. Using the rickshaw is a luxury and the woman chooses to walk, even though it is tiring and time consuming, rather than overspending on rickshaw rides.

The rest of the respondents, who are mostly housewives, have very limited mobility outside the camp. They explained that the bazaar and market are very close by so they do not need to go far. However, two of respondents take their child to school every morning. It takes them 20 minutes to reach the school and both of them stay until the end. One of them stated that she wakes up very early in the morning to prepare breakfast and get her child ready for school, she then walks to the school with other parents from camp. She returns to her house at 11 am every day which makes it difficult to complete the rest of the household chores on time. She added that there is no school transport service available for their child. One women

emphasized that even if the school offered a van for her child, she would refuse to let her child use it as she is very afraid of leaving her child on its own.

Apart from that, some of workshop participants visit the nearby hospital once or twice in six months. They use a rickshaw to visit the hospital in emergency situations.

The respondents are reluctant to spend from their limited daily earnings for transportation. As they have limited to no resources available to spend on transportation, they choose to work near to the camp or inside the camp. Their low incomes also limit their daily mobility out of the camp. Some of them suggested that they might spend a small amount on transportation if there was a van service available to school-goer children together with their mothers, so that they feel safe.

The second group included five working women working as part-time domestic helpers. All of their workplaces are very near to camp. One woman, in her late 40s, works at Tajmahal Road, 10 minutes' walk from the camp. She goes to her work at 10 am and return at 1 pm and earns 3,000 BGT and one meal from her employer. The woman mentioned that her responsibilities includes laundry, sweeping floors, cooking and cleaning the bathroom daily. She also added that she chooses to work in a nearby house as it is convenient, taking less travel time. She added that she is aware of the fact that she is underpaid by her employer as she knows that in places like Lalmatia and Dhanmondi domestic helpers receive higher wages but as these places are further to travel, she chooses underpayment over a time-consuming walk to a far flung workplace. She also said that she hardly uses a rickshaw to travel to work except for when it rains or she is ill.

This group of domestic helpers agreed that if they made more money from a distant workplace, then they would spend more on transportation. The group also expressed their desire for a minivan that could transport them to more highly paid jobs.

Case Studies

Case Study 1: Understanding the Relationship between Walkability and Quality-of-Life of Women Garment Workers in Dhaka, Bangladesh[1]

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Walking is probably the most important form of mobility since every trip starts and ends on foot. Especially for the poor in developing country cities', walking is a major transport mode. In Dhaka, Bangladesh, about 62% of daily trips are conducted by walking (Jönson, Tengström, & Tiwari, 2005)[2]. Over a million urban poor work in Bangladesh's garment industry. The vast majority are women. About 90% of them earn a minimal wage ($20-$70 a month) depending on occupation and overtime (Absar, 2002)[3] and face problems of getting decent accommodation, transport and commuting security, thereby exposing them to the typical problems of the poor living in urban habitats (Absar, 2002).

Women garments workers are a captive group (economically) who do not have other options except walking to work. This implies that they have to walk in any condition which in turn threatens their perceptions of satisfaction. Women garments workers in Dhaka are a particularly vulnerable group. They work late shifts and return home at night on foot which has an impact on their overall quality-of-life experiences. Based on safety and security, and the walking environment at night, they are more vulnerable than their male counterparts. Mobility and accessibility to jobs are two of the most important factors in providing quality-

[1] Summarized from: Shumi, S., Zuidgeest, M.H.P., Martinez, J., Efroymson, D. and van Maarseveen, M.F.A.M. (2014). Understanding the relationship between walkability and quality-of-life of women garment workers in Dhaka, Bangladesh. In: Applied Research in Quality-of-life, April 2014.

[2] Jönson, G., Tengström, E., & Tiwari, G. (2005). Self-organizing Systems and Innovations in Asian Cities Urban Transport Development (pp. 144-157): Springer Berlin Heidelberg.

[3] Absar, S. S. (2002). Women garment workers in Bangladesh. Economic and Political Weekly, 3012-3016.

of-life and both directly relate to quality-of-life of female garment workers. Moreover, the walkability of routes to work impacts on accessible employment opportunities and thus on overall life satisfaction. Safety, walking security, aesthetics, leisure walking, walking for health and so on all contribute to an individual's well-being. The experience of walking in Dhaka can represent an assault on the senses through exposure to smells (traffic fumes, urine), noise (constant honking, vehicle engines, industrial noise), visual assaults (ugliness and lack of visual appeal/relief), intense heat, and rain. Walking is dangerous because of obstacles and the poor general condition of sidewalks, and women are forced to walk on the road, sharing space with vehicles. Road crossings are unavailable and walking anywhere demands negotiating a passage through a mix of rickshaws, cars, and buses. Women also face harassment by men while walking at night along dark, narrow roads. Distances are long but the workers have to walk at odd hours in order to survive in this megacity.

Several studies have focused on women garment workers in Dhaka city, but none has looked at issues of walkability and its relation with quality-of-life. Given their lack of affordable alternative transport, most women garment workers walk four to five km every day, despite facing these problems (Efroymson, 2012)[4]. To elucidate their problems and to better inform local policy makers as to how to address them, it is essential to analyse the walking environment along the routes garment workers use to reach their jobs, and understand how this is linked to their individual well-being comprising subjective and objective indicators. In the case of subjective indicators, Campbell, Converse, and Rodgers (1976)[5] emphasized that the satisfaction level used to assess subjective quality-of-life is more better presented as 'life as a whole'. Moreover, life satisfaction considers reflective experiences and realistic views for policy makers and therefore seems to be a more accepted concept amongst researchers (Marans, 2003)[6].

[4] Efroymson, D. (2012). Sustainable Urban Transport (TA 6350) - Dhaka Bus Rapid Transit Walkability Strategy. Dhaka: Asian Development Bank.

[5] Campbell, A., Converse, P. E., & Rodgers, W. L. (1976). *The quality of American life: Perceptions, evaluations, and satisfactions*: New York: Russell Sage Foundation.

[6] Marans, R. W. (2003). Understanding environmental quality through quality-of-life studies: the 2001 DAS and its use of subjective and objective indicators. *Landscape and Urban Planning, 65*(1–2), 73-83.

A study on around the relationship between walkability and quality-of-life of women garment worker in Dhaka, Bangladesh was completed. Both the subjective and objective walkability indicators of walking routes were captured to understand the walkability level of the route used by the garments workers to travel to their workplace. This is important because the walkability of routes for the female garments worker can be treated as a social problem which is needs to be addressed.

The study considered five routes, all of which were frequently used by women garment workers. The similarities and differences between the routes were identified based on subjective and objective measures. This mixed method was helpful in understanding where objective measures and subjective perceptions were applicable to comprehending the route as a whole.

Sometimes subjective perceptions (the human perspective) and objective views of walkability (mainly road amenities) did not agree. It was concluded that different travel times were responsible for that result. Where objective indicators are applicable regardless time, subjective perceptions were dynamic, varying according to the time of travel. At night, the walkability of parts of the routes changed.

Subjective perceptions and objective measures are investigated at a personal level, however, places of fear, visually attractive areas, unsafe places, and other pleasant and unpleasant things were identified in the study through a combination of interviewees' perceptions. It was found that the perceptions of garment workers about safe, secure, visually pleasant places were more or less same. However, perceptions of convenience such as time, cost, route choice and so on, differ from person to person.

Regarding subjective measurement, the interviewees indicated their perceptions of walkability levels based on three or four issues where they stated that subjective measures or people's perceptions influence objective attributes. From the subjective perspective and objective measures, it was observed that female garments workers respond to different levels of walkability and that this has an impact on their daily lives. They perceive the walkability of a route not only by a satisfaction level based on the walking environment, but also by perceptions which differ according to different time of the day (day time and night time). Therefore, the places which they like to pass in the morning become places of fear at night and they avoid them to reach to the destination. However, where these routes are

unavoidable and they do not have an alternative, the women solve the problem by walking in groups with colleagues as they perceive that risks specially related to safety and security can be mitigated in this way.

This research has considered a specific vulnerable group who are captive walkers. If policy makers take into account the perceptions of the workers who use a route, it will be easier to identify specific places that require improvement. In this way, groups like women garment workers will benefit and their individual well-being will be enhanced, in turn improving their overall quality-of-life.

Case Study 2: Key Transport Issues for Working Women in Bangladesh: Analysis with Respect to Acceptance of Bus Rapid Transit[1]

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Dhaka, the capital city of Bangladesh, like other megacities, is experiencing serious traffic congestion (Alam & Habib, 2003)[2], one of the causes of environmental pollution. To reduce air pollution, the Government of Bangladesh, supported by World Bank finance, prepared a project 'Clean Air and Sustainable Environment' (CASE) (Dev Consultant Ltd., 2009)[3]. The aim of the project was to identify sustainable initiatives for reducing air pollution in Dhaka. As part of CASE, the Strategic Transport Plan (STP) for Dhaka was developed in 2004 (The Louis Berger Group, & Bangladesh Consultants Ltd., 2005)[4]. In 2009, a pre-feasibility study of Bus Rapid Transit (BRT) identified a pilot BRT corridor (Dev Consultant Ltd., 2009)[3]. This pilot corridor or the first route (BRT line 3 in STP) will be constructed along a 42 km stretch between Shibbari in Gazipur and Jhilmil near Keraniganj in Dhaka. It will be implemented in two parts: from Gazipur to Dhaka airport (20km) (i.e., Gazipur City Corporation); and from the airport to Keraniganj (22km) (i.e., Dhaka City Corporation); another 36km line will be built on the capital's eastern edge (Almec Corporation, Oriental Consultants Global, & Katahira & Engineers International, 2015)[5].

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[1] This research was done as PhD study (2015) in the Queensland University of Technology, Australia.

[2] Alam, J. B., & Habib, K. M. N. (2003). Effects of Alternative Transportation Options On Congestion and Air Pollution in Dhaka City. Journal of Civil Engineering, The Institute of Engineers, Bangladesh, CE 31(2), 165-175.

[3] Dev Consultants Limited. (2009, June, 2009). Clean Air and Sustainable Environment (CASE) Preparation Project, Final Report Consultancy Services for Pilot Bus Priority Corridor Pre-Feasibility Study.

[4] The Louis Berger Group, & Bangladesh Consultants Ltd. (2005). *Prime Minister's Office Library.* Retrieved from http://lib.pmo.gov.bd/legalms/pdf/draft-urban_transport_policy.pdf.

[5] Almec Corporation, Oriental Consultants Global, & Katahira & Engineers International. (2015). *The Project on the Revision and Updating of the Strategic Transport Plan for Dhaka.* Dhaka: Japan International Cooperation Agency (JICA), Dhaka Transport Coordination Authority (DTCA).

According to the Bangladesh Labour Force Survey 2010, labour force participation of women is 36%, compared to 82.5% of men. Even though significant numbers of female commuters travel to work every day, women do not enjoy same type of freedom as male commuters. Patriarchal and conservative society considers men as superior to women. According to Peters (1999), women in Dhaka have cultural constraints for properly accessing public transport because of social seclusion[6]. Male commuters have more access to various transport modes and their job responsibilities are recognized more than those of women (Peters, 2013)[7]. Another reason for women's lack of accessibility to transport modes is their inability to pay for transport. This is very significantly true for poorer women. Society not only underestimates their work responsibilities, but also undervalues their labour. In many situations, women get lower wages than their male counterparts, even those with similar duties.

The success of a BRT project lies in its acceptance by stakeholders, particularly its potential users. According to Levinson et al (2003), the most important principles of BRT implementation are translating BRT plans into the operating system, and identifying the respective urban area's own specific needs, opportunities and constraints[8]. This case study addresses these principles by identifying Dhaka's specific needs, opportunities and constraints. A project of this type and scale will only be successful if it is accepted by all stakeholders, particularly the commuting population. As stated previously, women comprised a significant percentages of the commuting population. In view of that it is important to understand the differences between before-BRT and after-BRT travel behaviour of commuters, in particular focusing on gender issues.

To investigate the differences of travel behaviour between before BRT and hypothetical after BRT scenario, two Multinomial Logit (MNL) models were calibrated on LIMDEP econometrics

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[6] Peters, D. (1999). *Gender Issues in Transportation: A Short Introduction.* Retrieved from The Institute for Transportation: https://www.itdp.org/wp-content/uploads/2014/07/DEALSGEN.pdf

[7]Peters, D. (2013). *Gender and Sustainable Urban Mobility*. Retrieved from http://www.unhabitat.org/grhs/2013.

[8] Levinson, H. S., Zimmerman, S., Clinger, J., Rutherford, S., Smith, R. L., Cracknell, J. A., & Soberman, R. (2003). Volume 1: Case Studies in Bus Rapid Transit. Retrieved from http://www.nbrti.org/docs/pdf/tcrp_rpt_90v1.pdf.

software with the Revealed Preference (RP) and Stated Preference (SP) survey data (Green, 1998)[9]. (The SP survey is a hypothetical survey with BRT choices; commuters had chosen the scenario that they thought the most suitable for them). These surveys were conducted on commuters in paid employment in Dhaka. MNL Model calibrated with the RP data provides the actual travel behaviour and significant factors of commuters for their work trip and MNL model calibrated with the PMS data provides the travel behaviour of commuters at hypothetical scenario after BRT would start operation.

The main modes of transport for work trips are walking, bus, rickshaw, CNG and car. A very low percentage of commuters use Laguna, battery operated rickshaw (made illegal by the government) or tempo. Motorcycles are also used for work trips.

Analyzing current travel behaviour revealed that for low income female commuters (i.e. with incomes of less than 140 USD) walk time is the greatest. Contrarily for all other income commuters (low income male, Middle income male and female, high income male and female), walk time is nil. In Dhaka, commuters are very reluctant to walk, mainly because of poor road conditions and lack of space on footpaths. Sometimes roads are broken, have manholes without any covers and rubbish piled beside roads, all of which make trouble for walkers. Walking on these types of roads takes excess time and causes accidents. Low income female commuters spend least for their travel; this is mainly because of tendency not to spend money for their own comfort. Middle income female commuters' 'in vehicle time' is the greatest among all commuters because they are the main users of bus. Even though large numbers of commuters use the bus for their commute to the work place, there is significant dissatisfaction with the bus service in Dhaka. About 35% of bus users stated that overcrowding was the main problem they faced on their way to work. Some stated that buses were sometimes so overcrowded that they did not stop to pick up waiting passengers. Another concern was the lack of seats, which is related to bus overcrowding. About eight percent of bus users stated that the bus fare was too high for the service and distance they travelled. Some female bus users stated the attitudes of male co-passengers and drivers were poor. Some also complained of occasional harassment from male passengers.

[9] Greene, W. H. (1998). LIMDEP (Version 7.0) [Econometric Software].

> "… Sometimes we don't even get into buses. In spite of availability of seats, the bus helper tells that there is no room inside the buses. They push us so that we cannot get into the buses."

Occasionally bus helpers do not want to board more female passengers because crowded conditions makes their isolation from male passengers difficult. Meanwhile, the Government of Bangladesh has ruled that 12 seats on each bus must be reserved for female passengers (Rahman, 2010)[10]. However, respondents stated that many times these seats are occupied by men. High income female commuters have more capacity to own a private vehicle which gives them the increased comfort, flexibility, safety and security. High income male and female commuters spent about same amount of money. Usually, a higher percentage of high income female commuters use cars to travel to work, compared to male commuters. However, due to Bangladesh's conservative society, even high income female commuters very rarely drive their own car.

The mode choice options for MNL model with the RP data are walk, bus, car and PPT. The attributes selected for the model are travel cost, travel time in motion, waiting time and social demographic characteristics, such as age, education, income and gender. The model result shows that commuters are sensitive to the travel cost of bus for work trip. Increasing the travel cost of bus decreases the probability of them selecting bus for their trip. However, the percentage of change of probability shows that commuters are relatively less responsive to the cost of bus fares. For all commuters in Dhaka, even at a very low bus travel cost, the probability of selecting the bus to travel to work does not increase significantly. This is mainly because those who have very limited income cannot afford to choose bus, even at a very low travel cost. Those who have high income do not wish to travel in bus even at low travel cost because the bus service in Dhaka is very ineffective and inefficient.

The model result also shows that Dhaka's commuters are sensitive to travel time in motion while traveling to the work place. Increasing travel time in motion would decrease the

[10] Rahman, M. S. (2010). Bus Service for 'Women Only' in Dhaka City: An Investigation. Journal of Bangladesh Institute of Planners, 3, 17-32.

probability of choosing bus as their preferred commute mode. Decreasing bus waiting time significantly increases the mode share of bus. Increasing waiting time for the bus means a greater reduction in the proportion of bus users compared to when increasing bus time in motion. As waiting time for the bus is already higher, increasing waiting time more would have significant negative impacts on commuters' decision to choose bus.

Commuters' mode choice decision varies with their gender, age, education and income. Poor female commuters are the most vulnerable. The findings of this analysis demonstrate that they are less able to afford to choose vehicular modes for their work trips. The model result showed that poor female commuters mostly walked to their work place. This group suffers from acts of discrimination while travelling on road.

There are significant differences of mode choice behaviour between poor female commuters and female commuters who are not poor. Female commuters who are not poor are more able to afford to choose their commute mode compared with their poor counterparts. There are also differences between female and male commuters who are not poor. Overall female commuters use less expensive modes compared to their male counterparts for work trip.

Age has an influence on workers mode-choice decision. Young commuters (age 35 or less) tend to choose less expensive and less comfortable modes for their work trip, irrespective of gender and educational qualifications. Young commuters have less financial stability and have more physical endurance to walk or to travel on crowded buses. However, for poor workers, age does not have any influence on their mode-choice decision.

Commuters with higher educational qualifications have a greater tendency to choose a more comfortable and expensive mode compared with their lesser qualified counterparts. This can be explained because, in Dhaka, those who have higher educational qualifications usually earn more money. Commuters with higher educational qualification have more ability to afford to choose their commute mode.

Female commuters are relatively less responsive to travel time in motion than travel cost. Mode share of walk is higher for female commuters than for male commuters. Male commuters are more likely switch to PPT, while female commuters are more likely switch to walking. This is mainly because of a sense of insecurity and safety while traveling by PPT.

Female workers on a budget have a greater tendency towards saving money for their families instead of spending for their own comfort while travelling by PPT.

Choices of model calibration for the MNL with stated preference data are: bus (including access mode), BRT (including access mode with comfort levels good, better and best), car and personalized public Transport (CPPT) and walk.

Male commuters are slightly more sensitive to bus travel time in motion, bus travel cost, BRT travel time in motion and BRT travel cost. The RP model reveals that female commuters tend more to switch to walk, compared to male commuters. However, in the PMS survey, female commuters' situation improved as the travel difference between male and female commuters are not significantly different.

Even though not the difference was insignificant, the male commuter group overall chose BRT at the reduction of bus travel time in motion and travel cost more than the female commuter group. The reasons for this may be either that females are more risk averse to switching from the existing bus mode to the BRT mode than males, or the nature of the survey design in that male respondents might have gained a better understanding of the benefits of BRT over bus, either through the way the survey questionnaire was provided to them, or their prior knowledge of the BRT proposal. However, it is still important that there is a distinctly different choice between males and females regarding BRT and bus, as a result of some or all of these factors.

Case Study 3: A Study on Travel Behaviour of Women Public Bus Users in Dhaka

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Dhaka, the capital city of Bangladesh, is one of the fastest growing cities of the world (Roy, 2009)[1]. Successive reports such as Strategic Transport Plan (STP), 2005 and Revised Strategic Transport Plan (RSTP), 2015 prepared for the government by Japan International Cooperation Agency (JICA) found that bus is the principle mode of choice for the dwellers of Dhaka. Though bus has vehicle share of 11%, it carries around 72% of all passengers (JICA, 2015)[2]. Several studies show that existing bus service in Dhaka City is in poor condition especially for the women (Zohir, 2003; Olsson and Thynell, 2004; Rahman and Nahrin, 2012; Asian

[1] Roy, M. (2009). Planning for sustainable urbanisation in fast growing cities: Mitigation and adaptation issues addressed in Dhaka, Bangladesh. Habitat International, 33(3), 276-286.Retrieved May 30, 2018 from https://www.sciencedirect.com/science/article/pii/S0197397508000684.

2 Japan International Cooperation Agency. (2015). The Project on the Revision and Updating of the Strategic Transport Plan for Dhaka. Retrieved January 26, 2017, from http://www.rthd.gov.bd/admin/docs/DFR_DTCA1.pdf.

Development Bank (ADB), 2013)[3,4, 5,6]. Personal safety and harassment on public transport are significant concerns for women travellers (ADB, 2013)[6]. This view is also supported by Adeel et al. (2014) and Bhatt et al. (2015)[7,8]. Rahman and Nahrin (2012) found that physical harassment, dissatisfactory behaviour of the staffs, poor time management of bus operators are the problems women traveller of Dhaka face regularly (Rahman and Nahrin, 2012)[5]. However, the perceptions of safe travel for women go beyond physical road safety to include risks of harassment, stalking, sexual assault, or rape (ADB, 2013)[6]. These perceptions have serious effect on women travel pattern. Bearing this in mind, this research aims at understanding the travel pattern of women public bus users in Dhaka. This study will be helpful for decision makers and related authorities, transport planners, transport engineers and other stakeholders to develop existing public bus service to ensure accessibility of women to public bus service.

Five areas of Dhaka (Jatrabari, Mohammadpur, Motijheel, Azimpur and Tejgaon) have been selected (Figure1) for the study considering the number of bus routes and ratio of women passengers in the area. These five areas have the highest ratio of women in terms of passenger as well as high number of bus route originating or passing through the area (Dhaka Transport Coordination Board, 2010; Rahman and Nahrin, 2012; JICA,2015)[2,5,7]. As figure 1

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3 Zohir, S.C. (2003). Integrating Gender into World Bank Financed Transport Programs- Case Study on Bangladesh. Retrieved April 24, 2016, from http://documents.worldbank.org/curated/en/451771468206959040/pdf/344920BD0Integ1ender0Dhaka01PUBLIC1.pdf.

4 Olsson, L., and Thynell, M. (2004). Bangladesh Road Transport Corporation (BRTC) Bus Project in Dhaka. Retrieved June 4, 2016, from http://www.sida.se/contentassets/d5f2c6b7cbb242bdb1de47a5fa57396e/0638-bangladesh-road-transport-corporation-brtc-bus-project-in-dhaka_2031.pdf

5 Rahman, M., & Nahrin, K. (2012). Bus Service in Dhaka City- User's Experiances and Options. Journal of Bangladesh Institute of Planners, 5, 93-105. Retrieved April 24, 2016, from http://www.bip.org.bd/SharingFiles/journal_book/20130820140314.pdf.

6 Asian Development Bank. (2013). Gender Tool Kit: Transport Maximizing the Benefits of Improved Mobility for All. Retrieved January 30, 2017, from https://www.adb.org/sites/default/files/institutional-document/33901/files/gender-tool-kit-transport.pdf.

7 Dhaka Transport Coordination Board. (2010). Dhaka Urban Transport Network Development Study-Household Survey.

displays these study areas are spread all over the city, considering a sample confidence level of 95% with 5% confidence interval, 384 women were asked to complete the survey in the five selected interception areas using a random sampling method. Though initially it was planned to interview equal numbers of respondents from each of the study areas, due to operational difficulty it was not possible.

Figure 1: Study areas with bus routes

(Base map source: DTCB, 2009)

The average age of the respondent is 27 years; however, it varies according to locality (Figure 2). The average age of respondent is 24 years in Azimpur, while in Mohammadpur and Motijheel it is 31 years. Data reveals that young (15-25) and middle aged (26-35) women are the dominant woman user of public bus. Most (25%) of the young women passengers (age 15-25 years) commute from Azimpur. This can be explained by the existence of women only higher educational institutes (Eden Mohila College, Home-economics College) as well as

higher educational institutes which are co-educational (Dhaka University, City College) in the area.

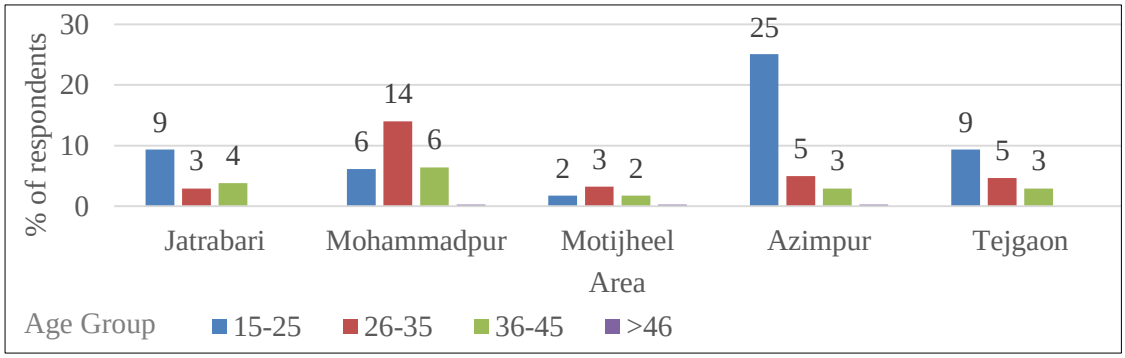

Figure 2: Area wise distribution of age of the respondents

Trip has been defined in this research as a both-way movement from a point of origin to a point of destination. According to this research, 71% of the women public bus user have on average two daily trips and 39% have five to ten average weekly trips.

Around 90% of the respondents travel less than two km to reach a bus stoppage. Again, the area wise distribution shows that, in Azimpur and Tejgaon area, most of the respondents travel less than 0.5 km (19% for Azimpur and 15% for Tejgaon) while in Mohammadpur area most of the respondents travel 0.5 to 2 km to reach the bus stop (Table 1).

Table 1: Area wise distribution of the respondents (in %) by distance traveled to reach bus stop from origin

Area	< 0.5 km	0.5km- 1.0 km	1.0 km-2.0 km	>2.0 km
Jatrabari	11	4	1	1
Mohammadpur	11	8	5	5
Motijheel	5	1	0	1
Azimpur	19	5	0	3
Tejgaon	15	3	1	0
Total	62	21	7	10

Figure 3 shows that most of the trips are toward the south-west side of Dhaka for Jatrabari (number of trips is 75). Again, in Mohammadpur area, most of the trips (60 trips) are toward the north-east side of Dhaka. Moreover, for Tejgaon area, the trips are towards north-west side.

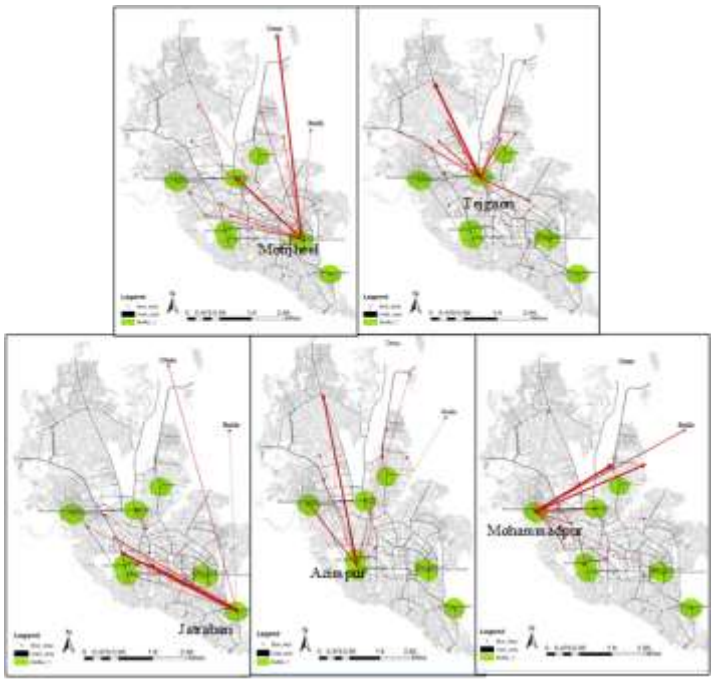

Figure 3: Distribution of trip from the study areas (Source: Author,2017).

Table 2 shows that most of the daily trips are for education (51%) and job (30 %) purpose. Most of the daily trips in Mohammadpur (12%) area is for job purpose while most of the daily trips in Azimpur area (19%) is for education purpose.

Table 2: Area Wise Distribution of the Respondents (in %) According to Trip Purpose and Frequency of the trip

Area	Purpose / Frequency	Job	Education	Health facilities	Others
Jatrabari	Daily	2	4	0	0
	Weekly	0	1	0	1
	Occasionally	0	1	4	1
Mohammadpur	Daily	12	10	0	0
	Occasionally	1	2	1	2
Motijheel	Daily	4	0	0	0
	Occasionally	0	0	0	1
Azimpur	Daily	6	19	0	0
	Weekly	0	1	0	0
	Occasionally	0	3	1	3
Tejgaon	Daily	4	8	0	0
	Weekly	0	1	0	0
	Occasionally	0	0	0	3

It was found that on average, a woman travels six km per day by bus (considering only those respondents who travel daily). The majority of the women travel four to seven km distance. In case of the distribution of respondents according to travel time, most of the respondents have travel time more than 1.5 hours (36%). This can be explained by traffic congestion on

road and long-distance travel. Though, distance travelled by bus in Mohammadpur area is more than other areas, the corresponding travel time is comparatively lower.

The average waiting time is 15 minutes for the women bus traveller. But it varies from location to location. Jatrabari has the highest average bus waiting time (34 min) while Mohammadpur has lowest waiting time (9 min). Azimpur and Mohammadpur which are origins for many bus routes have waiting times lower than Jatrabari and Tejgaon which are in the mid-section of bus route. Unavailability of designated women seat, overcrowding in the bus and delay of bus due to traffic congestion in the road might be the reasons behind the longer waiting time.

Most of the women (46%) has to pay 5-10 BDT (0.06 US $- 0.12 US$) for their fare. As the students pay half of the standard fare, there exist a significant relationship between occupation and bus fare.

This study shows that travel patterns of women differ from area to area. Major trip purpose is education (51%) and job (30%) while these trips are taken mainly daily (70%) and occasionally (26%). Women travel six km per day on average by bus whereas 36% of the women have travel time more than 1.5 hour. Formulation of new policies and implementation of the policies should address the need and travel pattern of women public bus users. Most of the women (71%) have on average two daily trips, while 20% and 19% of them are travelling from Mohammadpur and Azimpur area respectively. So, policy makers should increase the number of designated women seat and bus service for these bus routes. There should be provision of women only bus service for the bus routes having more female passengers. Moreover, 62% of the women travel less than 0.5 km and 90% women travel less than two km from their origin to reach the bus stoppage. Thus, there should be provision of women friendly footpath and bus stoppage. Therefore, we can ensure women friendly public bus service in Dhaka by addressing their travel behavior.

Conclusion

It is impossible to deny that Bangladesh is moving forward at a great speed and that the country's would be unsustainable without addressing the problems faced by half of the population, mainly vulnerable women workers. The harassment and insecurity of women in general, and lower income women in particular, while travelling on the road is reducing female contribution to the economy. Without ensuring safe and efficient transport options for women, the status of Bangladesh as a Lower Middle Income country through socio-economic development is threatened. For this reason, women should have a safer path to work and to return home from work; they desperately need freedom and rights to choose any transport option. Even women commuters with more spending capability cannot enjoy as much freedom as their male colleagues.

Therefore, women's dignity of travel is a social matter that must be addressed through policy change and awareness campaign by offering proper education. Investigating policy change and education for ensuring female commuters' dignity of travel would be a further research avenue. Some transport plan, policy and study are available for Dhaka. However, it is important to understand whether those policies are capable enough to combat the mobility issues of vulnerable women commuter group.

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