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Examining Vulnerabilities: the Cycle Rickshaw Pullers of Dhaka City

Syed Naimul Wadood^{1,*} and Mostofa Tehsum²

Abstract

Dhaka, capital city of Bangladesh, is one of the fastest growing cities of the world in terms of population concentration. Centrally located, it attracts a large number of job seeking migrants from the rural areas of entire Bangladesh on a continuous basis. Some of these job seeking migrants are readily absorbed in the urban informal service sector, which includes cycle *rickshaw pulling*. Cycle rickshaw pulling is arduous and stressful, with no promotion prospect or insurance for occupational hazards such as accident injuries, while entry is easy as education and training as well as capital asset requirement is minimal. In order to examine vulnerabilities of the rickshaw pullers, a structured questionnaire survey has been conducted on a total of 120 randomly selected cycle rickshaw pullers in five locations across the Dhaka city. The primary survey has examined their current living conditions, livelihood strategies, shocks and insurances against shocks. The respondents lacked education and skill training, did not own capital assets and mostly supported their families stationed in the rural areas with earnings from this cycle rickshaw pulling. Econometric models of OLS and probit regression have been utilized to examine a number of issues, and the results are expected. Most respondents were willing to educate their children and did not want to include them in this sector. There are potentials of entrepreneurship if they are skill trained, financed and advised properly. They are reported to be willing to improve their living conditions, which is difficult due to the vulnerabilities that they face.

Key Words: Cycle Rickshaw Pullers, Vulnerabilities, Migration, Urban Informal Sector, Sustainable Livelihood, Dhaka

JEL Classifications: I31, J46, J81, 017

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1. Background

Urban cities are the most important opportunity providers for many rural poor families who are attracted by the prospect of better livelihoods in these cities. Their migration to cities contributes to urban expansion, congestion and

an over-capacity situation. Many of these migrants continue to live in the cities in vulnerable conditions. Most of them suffer from lack of required job skill and education, necessary for getting jobs or doing something for earning livelihoods in an urban setting. The rural poor, who migrate to megacities like Dhaka, are mostly readily absorbed in the urban informal sector jobs with low entry requirements-- these include cycle rickshaw driving, entry-level works in the ready-made garments industry (this one is formal) or construction sites, running petty businesses besides the footpaths, etc. Some of these migrant workers get involved as manual transport workers. The wages earned from these jobs are generally low and the amount of physical labor that is required for these is often quite high, *cycle rickshaw pulling* being no exception. Additional income is only achieved in these jobs with some additional hours of work, so there is some form of hourly earnings in place here (with regards to cycle rickshaw pulling, some fixed amount of payments need to be made to the capital owner on a daily basis, in this case, owner of the cycle rickshaw). There is no upward mobility in terms of professional promotion in this occupation, and there are no scopes for pension and retirement benefits. Any long-term experience does not add any extra advantage in this occupation to earn some extra money. The cycle rickshaw puller (mentioned as RP later in this paper) carries a huge burden of traffic congestion, air, sound and dust pollution, unhealthy street food, hot sunshine as well as heavy rain, unfriendly traffic police, rude passengers, risk of accidents involving physical injuries, etc. The heavy physical exhaustion on an almost daily basis brings in long-term damages to the rickshaw puller's health (Begum and Sen (2005), pp. 16). Even though cycle rickshaw is non-motorized, and thereby environment-friendly, continuous driving of this vehicle for long many years takes a heavy toll on the physical ability of the cycle rickshaw pullers (op. cit, pp. 16).

The urban informal sector, including *cycle rickshaw pulling*, where both the consumers and the suppliers are mostly poor, and some belong to middle income group, is often overlooked in the public policy making and as such cycle rickshaw drivers are no exception (Kurosaki et. al. (2007), pp. 36). Given this background of vulnerabilities and policy neglect, this paper attempts to examine the issue once again. *The focus of this paper is to examine vulnerabilities and livelihood strategies of the cycle rickshaw pullers of the Dhaka city.* This study examines their social, financial and physical constraints, shocks and coping mechanisms, also examines their previous backgrounds, the rural backgrounds from which they have migrated, and their aspirations.

The paper has been organized as follows. Section 1 is the background discussion whereas Section 2 examines the cycle rickshaw pulling sector as a form of informal sector and its features. Section 3 is the problem statement whereas Section 4 discusses the livelihood issues of the rickshaw pullers. Section 5 is an overview of the literature. Section 6 discusses the background of the primary survey whereas Section 7 delineates the materials and methods of the primary survey, survey findings and regression estimation results. Section 8 concludes.

2. Cycle Rickshaw Pulling Sector as an Informal Sector in Dhaka City

Cycle Rickshaw pulling is arguably the most popular informal "profession" in Dhaka. Easy entry, cash income and simple rules of engagement pull a number of migrants to join this arduous occupation. Different studies and

evidences denote that rickshaw pullers are mainly the rural migrants freshly arriving in the city leaving their previous rural occupations in order to improve their livelihoods (Begum and Sen (2004, 2005), Tamanna (2012)). Some earlier estimates put as much as 65 per cent of the population of the capital city to be depended on the informal economy (Ubaydur et al. (2005), pp. 36). Rickshaw pulling is the most important informal economy occupation by the poor unskilled migrants to Dhaka city from the rural areas (Siddiqui et al. (1990), Begum (1997)).

Informal sector mostly works as a life line for the low-skilled urban poor. Absence of rights and social protection is a common characteristic of an informal economy. The workers, who are involved in the informal economy, generally live in upper level or absolute poverty due to lack of basic social needs and services and they are vulnerable to income and other types of shocks. They have to face exploitation, have no basic safety condition at work. They survive every day for earning their livelihood and have little hope or no hope at all for improving their standard of living (Alam 2012).

The work force involved in the informal sector supplies the needed labor to manufacturing, services and other sectors such as urban non-motorized transport works as rickshaw van drivers, rickshaw drivers etc. In Dhaka city *cycle rickshaw* is a popular transport for mobility in the entire city. It is mostly used by the middle class, lower middle class as well as the low income city residents. It is also the main means of transportation for who do not have cars and do not feel safe traveling by bus such as the senior citizens or the female citizens of this city.

In Bangladesh, the most popular local transport rickshaw is safe, convenient, and an affordable form of door-to-door transport. Rickshaw drivers manually peddle three wheelers to carry at least two adults weighing 150 kilograms and work for at least 6 hours. The minimum fare of the rickshaw is 10-15 BDT. At the present time, it will take 50 to 60 BDT to cover a distance of 3 kilometer journey by a rickshaw in Dhaka city. Most of the cases, this work is regarded as a temporary work as it is very stressful (Begum and Sen 2004).

Officially, around 80,000 licensed rickshaws are available in Dhaka city (Menchetti 2005). According to some studies, the actual number is at least 20 per cent more than those that are licensed and plied in the streets of Dhaka with informal consent of officials of the city corporation and the police. More than 90 per cent of the rickshaw drivers in Dhaka city come straight from the villages. This occupation employs over one million people (Rouse 2004). In one study, it showed that the average duration of residency in Dhaka city of rickshaw drivers is 11 years. About 60 per cent of the rickshaw drivers are married individuals living with their family, i.e. the entire family has migrated to the city (Begum and Sen 2005).

According to Begum and Sen (2005), recent entrants into cycle rickshaw driving choose this profession for reasons such as lack of jobs in rural areas, higher incomes and/or peer influence. Lack of property (e.g. land) in rural areas, 'push' the poor to enter into the urban informal sector whereas some mutual interest, coordination and peer networking amongst the rickshaw pullers 'pull' them to enter into the informal economy. In addition, environmental

shocks may push some of them to cities for livelihood (Reuveny 2007) (to note that in our primary survey we have found that some of the respondents have come to this profession because they have lost their farming land by river erosion).

3. Problem Statement

The profession of rickshaw pulling is characterized by part time, full time or seasonal employment. They have time flexibility in their profession. They can earn more if they feel good in exchange of more daily rent and additional physical stress. Most of the rickshaw drivers are coming from the economically laggard regions of the country. Most of them possess only a small amount of schooling and skill. Hence, we want to look into their condition of their livelihood. They have to find the cheap place for lodging and they have to take food at as low price as possible for saving the money from the little income in order to remit to their families. They have to suffer the most physical stress, which is bad for them later on in their lives-- also they are the direct victims of environmental pollution of Dhaka city. Hence, we want to look into how they cope up in these situations or plan to do so and how they survive with their meager but volatile income. Therefore, the problem statement of this paper is *to examine vulnerabilities, shocks, coping mechanisms of the cycle rickshaw pullers of the Dhaka City, this in combination of examining their future aspirations.*

4. An Overview of the Livelihood Issues of the Rickshaw Pullers

Demand Side: According to the Dhaka Urban Transport Network Development Study in Bangladesh 2010 report, the Strategic Transport Plan (2005) data indicates that rickshaw is the primary travel mode for 36 per cent of all personal trips. According to the Greater Dhaka Metropolitan Area Integrated Transport Study (DITS) the corresponding value in 1994 was 19 per cent (DITS (1994) as cited in STP (2005), pp. 149). The average length of rickshaw trips is 2.34 km and 61 per cent of the rickshaw trips are made by the people whose income is between BDT 12,500 to 55,000 per month (STP, 2005). Demand for rickshaw trips among the other income brackets: 39 per cent by low income, 43 per cent by middle income and 18 per cent by high-income brackets (in another report, the average trip length is reported as 3 kilometers per trip (DHUTS Report of JICA (2010)).

Supply Side: According to the data of the Dhaka City Corporation in the year of 2014 Dhaka streets were crowded by around 225,000 rickshaws (Shofiq (2017)). Among these rickshaws 137,189 rickshaws lack valid legal documents. The Dhaka City Corporation is entitled to issue license for rickshaws in the capital city. One officer of City Corporation stated that the issuing of new licenses was stopped in the late 1980. But everyday there are new rickshaws in the roads without possessing a valid license (op. cit.). In some key roads rickshaws are banned for many years. But sometimes they have been roaming freely on those roads by breaking the rules. Cycle rickshaw fare is high compared to bus fare because of short travel distance. Now-a-days the fare of the cycle rickshaws is around BDT 20 per kilometer (source: our survey observation), and there have been increases in fare rates in recent years.

Earnings: Most of the times the day to day earnings in this occupation fluctuate. If the cycle rickshaw puller does not go to work due to illness or any other reason, they will not receive any earnings for that day. The earnings earned from this arduous job are not sufficient for sustainable livelihood.

Ownership of the Rickshaw: According to one member of the Dhaka Rickshaw and Van Owners' Federation, there are currently 6000 garages and about 250,000 rickshaws in Dhaka. At least 800,000 to 1,000,000 men are engaged in this profession. Ownership of rickshaw is often problematic since storing of the vehicle poses problems for the owners who frequent village homes quite often. Additionally, there are not enough places for the rickshaw pullers to keep their rickshaws. Currently it is also difficult to obtain the rickshaw license also. The owner of rickshaw has to pay garage fare around BDT 300 taka per month. The rickshaw pullers generally have to pay BDT 60-110 as the rental cost to rent it for 5-12 hours on a daily basis.

Types of Rickshaw Pullers: Dhaka is known as the “capital of employment opportunities”. Some people who are involved in agricultural activities in their villages come to Dhaka in the crop agriculture off season to pull rickshaw for earning some extra income. This way they achieve a portfolio combination of their income. And the rest of the pullers are known as the *regular rickshaw pullers*, generally full time. And the former are known as the *seasonal rickshaw pullers*. Since flexibility of time is there, some opt for part time rickshaw pulling as well.

5. Overview of the Literature

Topic: Sustainable Livelihood

According to the report of an Advisory Panel of the World Commission on Environment and Development (WCED 1987, pp. 2-5, as cited in Chambers and Conway (1991), pp. 5):

“Livelihood is defined as adequate stocks and flows of food and cash to meet basic needs. Security refers to secure ownership of, or access to, resource and income-earning activities, including reserves and assets to offset risk, ease shocks and meet contingencies. Sustainable refers to the maintenance or enhancement of resource productivity on a long term basis. A household may be enabled to gain sustainable livelihood security in many ways-through ownership of land, livestock or trees; rights to grazing, fishing, hunting or gathering; through stable employment with adequate remuneration; or through varied repertoires of activities”.

Modifying the above definition, Robert Chambers and Gordon R. Conway propose the following definition of *sustainable livelihoods* (Chambers and Conway, pp. 6):

“A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living; a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global and in the short and long term.”

We examine the sustainable livelihood issue of the cycle rickshaw pullers of the Dhaka City from the point of view of Chambers and Conway. One key concern is that: can cycle rickshaw pulling (in this particular case) be considered as a form of sustainable livelihood?

Topic: Vulnerabilities

“Vulnerabilities” sometimes sounds as same as the term “poverty”. But there are some conceptual differences between “poverty” and “vulnerabilities”. Generally, the nature of poverty is static and vulnerabilities is mostly dynamic. People may move in and out of poverty, whereas households’ resilience and threats are identified by vulnerabilities. We can use the definition of “vulnerability” as proposed by Robert Chambers (1989, pp. 1):

“the exposure to contingencies and stress, and difficulty in coping with them. Vulnerability thus has two sides: an external side of risks, shocks and stress to which an individual or household is subject; and an internal side which is defenseless, meaning a lack of means to cope without damaging loss. Loss can take many forms-- becoming or being physically weaker, economically impoverished, socially dependent, humiliated or psychologically harmed.”

There are some indicators to measure vulnerability: (i) *poverty*: the intensity and rate of poverty, (ii) *employment and unemployment*: the risk of becoming unemployed is directly linked to the insecurity of the position occupied in the society, (iii) *work condition and health*: a poor state of health makes someone vulnerable to difficult work conditions, and (iv) *debt*: the capability of repaying the loans and interests could be a factor in determining household vulnerabilities.

Topic: Cycle Rickshaw Pulling as a Livelihood

According to Begum and Sen (2004, pp. 14), rickshaw driving on a continuous basis is a hard work. It has been observed that after the age of fifty it is hard to drive it throughout the entire week. At that time, they tend to drive three to four days a week which may cause a decrease in their daily income. A survey of former rickshaw pullers revealed that as many as 85 per cent of sampled respondents left their job due to their inability to continue such a tiring work as cycle rickshaw pulling. As a response to query regarding the main problems associated with cycle rickshaw pulling, three-quarters of current and 90 per cent of former pullers mentioned “physical exhaustion” and “fatigue”.

Begum and Sen (2004, pp. 7) also mention that, there are short term/circular/seasonal migrations in the Dhaka city which will continue to increase day by day. Majority of the migrants are from the lowest strata of the society. In the city like Dhaka the demand for unskilled labor are also increasing as well as the skilled labor. People from different areas of the country do not participate equally in this profession in Dhaka city. The largest contributing cities are Mymensingh, Rangpur and Barisal. The next largest contributors are Bogra, Faridpur, Dhaka, Dinajpur and Comilla districts. These are mostly suffered by drought, river erosion, flood and poverty-- therefore cycle rickshaw pullers in Dhaka city mostly originate from “poverty pockets” within the country (see MICS Report (2015)). We find support for this in Reuveny (2007, pp. 665), it mentions that, some people of rural Bangladesh have migrated to the cities as natural calamities created problems for this people. Some environmental push factors such as droughts, storms,

floods, water scarcity push them to urban centers for their livelihood; other push factors included overpopulation and rural poverty.

According to Begum and Sen (2004), people chose this type of employment due to lack of employment, no way of getting incomes or earning money, peer influence, lack of assets such as agricultural land and house in the rural area. In that situation rickshaw pulling became as a pull factor for the rural poor to enter into this type of employment for their livelihood in urban areas. Only sometimes, due to mutual interest people chose to be in rickshaw pulling.

Chowdhury (2005) discusses the growing informal sector and rickshaw-pulling recognized as expanding source of employment in Bangladesh but the government discriminates these small enterprises. He finds out that developing country like Bangladesh has surplus labor force, while, the raise of the informal sector provides employment for poor and uneducated labor force especially in the rural and urban areas. Manna et. al. (2012) mentioned that cycle rickshaw pullers are aware of the hazards of their occupation. They could be guided for taking care of their health by improvising their living style and work practice.

6. Background of the Study Area

Dhaka is the capital city of Bangladesh. It is also the largest city in the country. By the end of 2017, the population of this Greater Dhaka area has been around 18.9 million. Dhaka is one of the most populated cities in the world also. As of the estimation of 2016, the (inner) city itself only had a population of about 8.5 million. It is one of the most densely populated areas in the world as its density of population is 23,234 people per square kilometer. The total area of Dhaka city is 300 square kilometers (World Population Review web site).

We have conducted a primary structured questionnaire survey, face-to-face interview of some cycle rickshaw pullers of Dhaka city, and for this we selected five locations throughout the city. There are some places in Dhaka city, which are particularly over populated and highly concentrated with high numbers of manual transport workers such as cycle rickshaw pullers, bus conductors, day laborers etc. Keeping this in mind and locating spots so that the city is covered in all directions, we chose five spots for the collection of the primary data. These places are: *Tejgaon*, *Kamrangirchar*, *Babubajar*, *Modhubag* and *Mirpur*. While *Mirpur* lies to the north-west, *Tejgaon* and *Modhubag (Ramna)* are at the center, *Kamrangir Char* is to the south-west and *Babubazar (Kotwali)* is in the south within the city. We also visited the respondents' local houses to obtain their responses and observe living arrangements (see Figure 1).

puller respondents within the cluster locations. Data was checked for consistency and stored in MS Excel spreadsheet, and Stata version 12 was used for data analysis.

7.3 Data Analysis and Interpretation

7.3.1 Statistical Analysis

Table 1 (through to Table 9) exhibits some statistical findings of the primary survey. Out of a total of 120 respondents, the north-west township *Mirpur* has the highest 31 respondents, and the south-west outskirts of *Kamrangir Char* has the lowest 19 respondents. Around 90 per cent of the respondents reported to be full timers, whereas only 5 per cent are part timers and 5 per cent are seasonal. Only 6 out of 120 respondents are owners, whereas 114 of them are renters. Because of high muscle power requirement and social disapproval, females are absent from this informal job (0 per cent). In terms of age groups, 38 per cent are in the group of 30 to 39, whereas a high 86 per cent are within age of 20 to 49. In terms of education level obtained-- a high 48 per cent has no education at all, and only 6 per cent has any education of Secondary School Certificate (SSC) or equivalent and beyond. Our sample found 90 per cent of our respondents to be married, and 74 per cent stay alone in Dhaka whereas family stays in the villages, family mainly depends on remittances sent by the RP. Within the married RP cases, 75 of the wives are home makers, and 29 are garment factory workers or poultry/cattle raisers. A high 86 per cent of the RPs has number of children within three. As for district of origin, 56 per cent mentioned Northern districts and remaining mentioned Non-Northern district.

(In Table 2) 78 per cent RPs mention “job search” as their purpose of migrating to Dhaka city, and 22 per cent mention other reasons. As for causes of entering into cycle rickshaw pulling, most mentioned easy cash income, higher earnings compared to previous jobs, flexible hours, etc., and yet some mentioned easy entry requirements and low capital or training requirements. Motivation to escape poverty was also mentioned as a factor behind entering into rickshaw pulling, same as finding no better scope than this.

This needs to be understood within the context that a high 97.5 per cent of the RPs were reported to be aware of health hazards associated with rickshaw pulling.

Table 3 exhibits that 41 per cent of the RPs entered this sector within the last five years, whereas the average number of years is around 11 years (standard deviation of 8.55 years). Table 4 shows the average daily income to be BDT 593 (standard deviation of BDT 111). Table 5 exhibits that earnings differ to some extent by the location of the RPs-- *Tejgaon* location RPs earn on an average BDT 113 more per day compared to *Mirpur* location RPs, higher by around 21 per cent (this difference is statistically significant at 1% level of significance). Even though there is no restriction for the RPs within the city where they pull their rickshaws, still we see earnings differentials across locations.

Table 6 is self-explanatory with some comments incorporated. Table 7 exhibits that RPs generally do not report badly of their passengers’ or traffic polices’ behaviors towards them, again they report well about their fellow RPs’ behavior towards them. Table 8 exhibits that smoking is wide spread among them, 78 per cent reported their about their smoking. Obtaining loans from non-government organizations (NGOs)

are common with around 49 per cent reporting loan taking, whereas 23 per cent took loans from informal sources such as friends, relatives or informal money lenders. With regards to problems associated with rickshaw pulling, a number of issues were mentioned, such as, food and accommodation, traffic police, traffic jam, risks of theft, risks of accidents, problems of not having arrangements of rickshaw stands, others, etc. This response exhibits that RPs are vulnerable to many a number of risk factors, they suffer from traffic jam issue, and again they bear the huge burden of dust, air, water pollution, food and accommodation problems, and so on (our survey team also reported about their deplorable living arrangements).

Table 9 exhibits responses about future plans. A high 53 per cent has plan to change the current career (cycle rickshaw pulling), and of these 64 positive responses, 36 respondents wanted to start businesses of their own. Only 20 per cent has any career plan regarding their wives, whereas 89 per cent RPs have some career plans chalked out for their children. Around 53 per cent responded that they had some retirement plans for themselves. The RPs are keen about providing education for their children, and they do not want to bring their children into this rickshaw pulling job.

Table 1: Basic Profile of the Respondent Cycle Rickshaw Pullers

Variable	Classification	Frequency (N=120)
Working Area	<i>Tejgaon (Center)</i>	24 (20%)
	<i>Kamrangir Char (South-West)</i>	1e9 (15.83%)
	<i>Babubazar (South)</i>	26 (21.67%)
	<i>Modhubag (Center)</i>	20 (16.67%)
	<i>Mirpur (North-West)</i>	31 (25.83%)
Rickshaw Puller	Regular (Full time)	108 (90%)
Classification	Part time	6 (5%)
	Seasonal	6 (5%)
Ownership of the Rickshaw	Own	6 (5%)
	Rented	114 (95%)
Gender	Male	120 (100%)
	Female	0 (0%)
Age Group	15 to 18 years	9 (7.5%)
	20 to 29 years	31 (25.83%)
	30 to 39 years	46 (38.33%)
	40 to 49 years	26 (21.67%)
	50 to Above	8 (6.67%)
Education Achieved	0 (No education)	57 (47.5%)
(RP Himself)	Class 1 to 5	32 (26.67%)
	Class 6 to 10	25 (20.83%)
	SSC or more	6 (5.83%)

Marital Status	Married	108 (90%)
	Unmarried	10 (8.33%)
	Divorced	2 (1.67%)
With family, or stay alone?	Stays alone in Dhaka, family in the rural areas	89 (74.17%)
	Stays in Dhaka with family	31 (25.83%)
Wife's Occupation (in case respondent is married)	Home maker	75 (69.44%)
	Garment factory worker	15 (14%)
	Poultry, cattle rearing	14 (13%)
	Other categories	4 (3.7%)
Number of children of the RP	0	13 (10.83%)
	1	22 (18.33%)
	2	42 (35%)
	3	27 (22.5%)
	4	9 (7.5%)
	5	4 (3.42%)
	6	3 (2.5%)
District of Origin	Northern Districts	67 (55.83%)
	Non-Northern Districts	53 (44.17%)

Table 2: Reasons for Migrating to Dhaka and Entering Rickshaw Pulling Profession

Query	Responses	Frequency (N=120)
Purpose of Migrating to Dhaka	For Job Search	93 (77.5%)
	Other Reasons	27 (22.5%)
Causes of Entering Cycle Rickshaw Pulling	Instant Cash Income	28 (23.33%)
	Higher Earnings compared to Earlier profession	17 (14.17%)
	Flexible hours	11 (9.17%)
	Easy to enter this profession	9 (7.5%)
	No training or capital assets required	14 (11.67%)
	To escape poverty	14 (11.67%)
	No other good job opportunity	18 (15%)
	To repay debt (debt due to earlier business losses)	9 (7.5%)

Table 3. Number of Years spent in Dhaka city as a RP

Time Spent in Dhaka as a RP	Frequency	Per cent (N=120)
<1 to 5 years	41	34.17
6 to 12 years	35	29.17
13 to 18 years	24	20
20 to 26 years	12	10
28 to 37 years	8	6.67
Total	120	100.00

Table 4. Daily Working Hours and Daily Earnings as RP

Variable	Observation	Mean	Std. Dev.	Minimum	Maximum
Daily Work Hour	120	9.48 (Hour)	2.13	5	13
Average Daily Income (Reported, Last 1 Year)	120	593 (BDT)	109.23	350	900
Max. Daily Income (Reported, Last 1 Year)	120	737.67 (BDT)	154.30	400	1,250
Min. Daily Income (Reported, Last 1 Year)	120	431.17 (BDT)	133.51	100	800

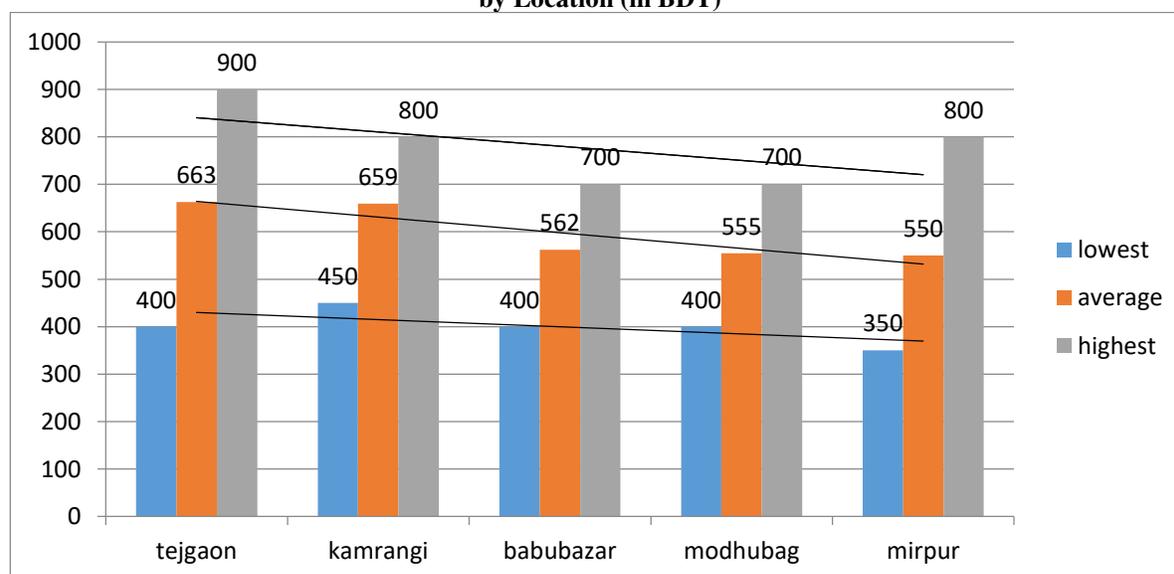
Table 5. Average Earnings Per Work Day Reported by Respondent RP (Last One Year), by Location (in BDT)

Table 6. Responses to Different Questions regarding Rickshaw Pulling

Variable	Observation	Mean	Std. Deviation	Minimum	Maximum
Monthly household Income (BDT)	120	14,699.33	3719.56	5,400	40,000
Family's' Monthly Savings (BDT)	120	807.5	2021.90	0	16,000
<i>[Regarding monthly family savings, 85 households (71%) reported BDT 0 amount of savings, 22 (18.33%) households reported of up to BDT 1,000, and rest 13 (10.67%) reported more than BDT 1,000]</i>					
Family Debt (BDT)	120	19,566.67	28140.92	0	150,000
<i>[Regarding family debt, 59 households (49%) reported BDT 0 amount of debt, 24 households (20%) reported debt up to BDT 20,000, and 37 households (31%) reported family debt of more than BDT 20,000]</i>					
Crop land & homestead (decimal)	120	7.6	14.82	0	132
<i>[Regarding crop land & homestead, 79 households (66%) reported land ownership of only up to 5 decimals, whereas 16 households (13.33%) reported no ownership of crop or homestead land]</i>					
Time spent as a RP in Dhaka (years)	120	10.93	8.55	.2	37
Weekly work days (Days)	120	6.26	0.92	2	7
Rental rate per day (BDT)	114	98.60	15.10	50	120
Number of Children	117	2.23	1.32	0	6
Number of Persons Dependent upon Income	120	3.43	1.49	0	10
Daily Cost for bad Habits (BDT)	118	23.48	17.52	0	100

Table 7: Working Conditions Related Information

Variable	Observation	Frequency	Per cent
Behavior of Rickshaw owner	Good	111	94.07
	Bad	2	1.69
	Average	2	1.69
	Not Applicable	3	2.54
	Total	118	100.00
Behavior of Passenger	Good	68	56.67
	Bad	6	5.00
	Average	46	38.33
	Total	120	100.00
Behavior of Traffic Police	Good	24	20.00
	Bad	80	66.67
	Average	16	13.33
	Total	120	100.00
Relation among fellow RP	Good	116	96.67
	Average	4	3.33
	Total	120	100.00
Cost coverage of rickshaw servicing	Self-cost	7	5.83
	Both owner and self-cost	113	94.17
	Total	120	100.00
Monthly Income	BDT 5,400-14,000	52	43.33
	BDT 14,300-20,000	63	52.50
	More than BDT 21,000	5	4.17
	Total	120	100.00
Awareness of Health Hazard in Rickshaw Pulling	Yes	117	97.50
	No	3	2.50
	Total	120	100.00

Table 8. Livelihood Related Information

Variable		Frequency	Per cent
Medical Services	Pharmacy	101	84.17
	Hospital	3	2.50
	Doctor	14	11.67
	Private Hospital	2	1.67
	Total	120	100
Monthly Savings	0	85	70.83
	BDT 200-2,000	22	18.33
	BDT 2,500-4,000	7	5.83
	BDT 5,000 and more	6	5.00
	Total	120	100
Loans from NGOs	Yes	59	49.17
	No	61	50.83
	Total	120	100
Informal source loans	Yes	28	23.33
	No	92	76.67
	Total	120	100
Purpose of loan	Household	23	38.33
	Medicare	10	16.67
	Others	27	45.00
	Total	60	100
Bad Habits	Smoking	93	77.50
	Others	27	22.50
	Total	120	100
Problems of rickshaw pulling	Food and accommodation	10	8.33
	Traffic police	15	12.5
	Traffic Jam	27	22.5
	Risks of theft	12	10
	Accident	10	8.33
	No rickshaw stands	9	7.50
	Others	37	30.83
	Total	120	100

Table 9. Future plan on different crisis situations and strategies to cope up against those situations

Variable		Frequency	Per cent
Any plan to change career?	Yes	64	53.33
	No	56	46.67
	Total	120	100
How to change this career?	By doing business	36	56.25
	Farming	5	7.81
	Others	23	35.93
	Total	64	100
Any career plan for wife?	Yes	22	20.00
	No	88	80.00
	Total	110	100
Any plan for children's future career?	Yes	96	88.89
	No	12	11.11
	Total	108	100
Any retirement plan for own?	Yes	63	52.50
	No	57	47.50
	Total	120	100

In the Appendix section, Image 1 exhibits a typical Dhaka cycle rickshaw, whereas Image 2 exhibits photo of a rickshaw puller of Dhaka city and his colleagues. Image 3 exhibits a simple model of livelihood strategies of rickshaw pulling in Dhaka city, as that has emerged from our primary survey. As rural poverty originates vulnerabilities and shocks, rural unemployed youth responds by migrating to Dhaka city (considered a “city of employment”). With very low amount of education and skills, they only get absorbed in the informal sector (often with some help from previous local contacts), the most common one being *cycle rickshaw pulling*. Here they obtain some quick cash to face counter further shocks and reduce vulnerabilities, even while facing risks of absorbing city pollution in the process and falling health over time. Within this long way towards reduction of vulnerabilities, the rural unemployed youths (and later on rickshaw pullers) make use of a number of livelihood strategies, these are: taking loans, reduction of consumption and savings, trying for more labor effort, living in Dhaka alone while keeping family home to keep lower expenditure, and educating children for the sake of a better future, selling assets in extreme shock situations, sending family members to in-laws' houses for some time (these are brought out in our primary survey responses, in different communications).

7.3.2 Econometric Analysis

7.3.2.1 OLS Regression of Reported Rickshaw Pulling Earnings

Now we run an ordinary least squares regression of reported average daily earnings from rickshaw pulling as reported by the RPs, as against a number of explanatory variables.

OLS Regression: Econometric Specifications:

$$Y_i = B_1 + B_2X_{2i} + B_3X_{3i} + \dots + B_kX_{ki} + u_i$$

-- where:

Y= dependent variable (natural log of average daily income from rickshaw pulling only)

X = independent variables (explanatory variables)

B₁ = the intercept

B₂ ... = the slope terms

u = the error term

i subscript denotes the ith observation (see Gujarati (2011), pp. 2)

We find that, the estimated coefficient of *daily working hour (workhr_daily)* is statistically highly significant that is at 1 per cent level and of positive sign. This was expected, the more working hours a respondent RP will work, the more earnings he is to generate. Location terms are found to be statistically jointly significant at 1 per cent level. The earnings of the respondents from *Tejgaon* and *Kamrangirchar* locations are higher than the other sample areas, say compared to the base location of *Mirpur*. This is an interesting result-- RPs differ in terms of earnings they make partly depending on location of their cycle rickshaw stand. With regards to age, the *age categories of 20s* are the prime earners, earnings do not increase as age increases, and rather it falls. Rather than any promotion ladder, what we see is a decrease in earnings from this informal job. Age categories have been found to be jointly statistically significant, but only at a 10 per cent level. The RPs who owned their rickshaws tend to report less average earnings (*own_rickshaw*), controlling for other variables (only 6 of our respondents out of 120 owned their rickshaws, each owning one). The RPs who owned higher amount of cropland in their villages reported to earn more from rickshaw pulling (*cropland*). Some other variables did not exhibit statistically significant impacts on rickshaw pulling earnings, such as, family size, marital status, any education or not, whether the RP came from Northern districts or not, whether the RP is seasonal or not, whether has debt or not, etc. To summarize, the main determinants of **reported average rickshaw pulling earnings per day during the last one year** are location, age, number of hours the RP has spent on rickshaw pulling per day on an average, amount of crop and homeland owned by the RP, etc. The econometric model itself is statistically significant with p value of F value at 0.000, and R squared value is 0.556 (see Table 10).

Table 10: OLS Regression Results with Robust Standard Error (N=120)

OLS Regression Results with Robust Standard Errors (N=120)				
Dependent Variable: q1_18= natural log of average daily income (from rickshaw pulling only) of the rickshaw pullers (in BDT)				
Independent Variables	Estimated Coefficient	Robust Standard Error	t-value	p>[t]
Familysize	6.805	5.050	1.35	0.181
Tejgaon	136.252***	27.140	5.02	0.000
Kamrangi	125.189***	24.929	5.02	0.000
Babubajar	40.626*	23.316	1.74	0.084
Modhubag	-0.609	22.231	-0.03	0.978
age10s	-50.470	44.603	-1.13	0.261
age30s	-38.261*	20.511	-1.87	0.065
age40s	-46.182**	22.791	-2.03	0.045
age50s	-80.282*	43.688	-1.84	0.069
age60s	-66.819**	29.703	-2.25	0.027
North	14.017	21.650	0.65	0.519
seasonal	9.189	34.898	0.26	0.793
no_edu	-25.633	16.597	-1.54	0.126
unmarried	-47.372	33.488	-1.41	0.160
own_rickshaw	-89.329***	28.442	-3.14	0.002
crophomeland	1.728***	0.317	5.45	0.000
workhr_daily	17.825***	3.561	5.01	0.000
has_debt	16.795	17.159	0.95	0.342
Constant	362.132***	46.880	7.72	0.000
Here, Variable “Mirpur” is the base location of the respondents’ sample area (of rickshaw pulling). Variable “age20s” is the base age of the respondent rickshaw pullers.		Number of Obs. = 120 F (18, 101) = 9.97 Prob.> F = 0.000 R-squared = 0.556 Root MSE = 79.048		
Joint significance tests: (1) tejgaon = 0 (2) kamrangi = 0 (3) babubajar = 0 (4) modhubag = 0 F (4, 101) = 13.83 Prob> F = 0.0000 Result: Locations are jointly significant at 1% level		Joint significance tests: (1) age10s = 0 (2) age30s = 0 (3) age40s = 0 (4) age50s = 0 (5) age60s = 0 F (5, 101) = 1.99 Prob.> F = 0.0867 Result: Age categories are jointly significant at 10% level		

Here, *** implies significance at 1% level, ** implies significance at 5% level and *implies significance at 10% level

7.3.2.2 Probit Regression of Likelihood of Wanting to Change Rickshaw Pulling Career

Here we follow discussions of Gujarati (2011, pp. 151) for a brief outline of the probit model. The probit model, under the assumptions of normality (the error term has a normal distribution), is given by the following equation,

$$P_i = \Pr(Y=1|X) = \Pr(i_i^* \leq i) = \Pr(Z_i \leq BX) = F(BX)$$

-- where $\Pr(Y|x)$ means the probability that an event occurs given the values of the X variables and Z is the standard normal variable (a normal variable with zero mean and unit variance). Here F is the standard normal CDF (cumulative density function), which can be given by,

$$F(BX) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{BX} e^{-z^2/2} dz$$

P is the probability that an event occurs (in our case, the respondent RP is willing to change his career from the current rickshaw pulling to some other career).

Seasonal Rickshaw Pullers want to change their career most There is a likelihood for changing the career of the respondents of this informal sector. This study has divided their class of work before. Among them, our study found that the seasonal rickshaw pullers want to change their career most. Through the probit regression model it is seen that seasonal rickshaw pullers want to change their career at 5 per cent level of significance. It is because seasonal rickshaw pullers are not dependent upon only this profession. The seasonal rickshaw pullers are mainly the agriculture related labor. When seasonal paddy or crops are husked and there is no work in the villages they often come to Dhaka city for searching jobs. This is one kind of livelihood strategy that they pursue. Some rural residents come to Dhaka city during the rainy reasons when there is excessive rain and in some areas many crop fields go under the flood water. There are also some other rural residents who opt for work in the brick kilns. They also come for pulling rickshaws for several months of a year. Our primary survey finds that the rural youth who do not have enough lands for farming and are not educated enough tend to come to Dhaka city before the Eid festivals for earning some extra money. Among the respondent of this study there were 6 rickshaw pullers, each of them had one rickshaw each. These respondents want to change their career and sometimes try to leave this profession. The study has found that these people are at the 10 per cent level of significance who has own rickshaw and want to change the career. They are in the better situation so it is possible for them to do some other businesses or give his rickshaw to other rickshaw pullers in exchange of rent. Interestingly the study has found that the rickshaw pullers or the respondents of *Tejgaon* area compared to the base location of *Mirpur* locations are less likely to decide to change their career, the result is negatively significant at 10 per cent level. It is seen that the daily income of the respondents of this area is little bit higher than the other study areas. May be that is the motivating factor for staying in this profession. In this probit regression model locations are not jointly significant. Age categories are not jointly significant also.

Table 11: Estimation Results from the Probit Regression

Probit Regression Results with Robust Standard Error (N=120)			
Dependent Variable: Do you want to change your current rickshaw pulling occupation? (Yes= 1, No= 0)			
Independent Variables:	Estimated Coefficient	Robust Standard Error	p-value
familysize	0.085	0.089	0.342
tejgaon	-0.746*	0.431	0.084
kamrang	-0.654	0.409	0.110
babubajar	-0.250	0.420	0.552
modhubag	-0.458	0.407	0.261
age10s	-0.682	0.615	0.267
age30s	0.117	0.331	0.725
age40s	-0.242	0.399	0.544
age50s	0.596	0.573	0.298
age60s	0.305	0.945	0.747
north	0.288	0.337	0.393
seasonal	1.257**	0.620	0.043
edu_no	-0.321	0.271	0.236
unmarried	0.549	0.567	0.333
own_rickshaw	1.042*	0.630	0.098
crophomeland	0.006	0.008	0.475
workhr_daily	-0.092	0.065	0.158
has_debt	-0.405	0.288	0.158
constant	0.827	0.852	0.332
Here, Variable “mirpur” is the base area of the respondents’ sample area (of rickshaw pulling). Variable “age20s” is the base age of the respondent rickshaw pullers.		Number of Obs. = 120 Wald chi2(18) = 28.47 Prob> chi2 = 0.055 Log pseudolikelihood = -69.369 Pseudo R2 = 0.163	
Joint significance tests: (1) [wntchange]tejgaon = 0 (2) [wntchange]kamrang = 0 (3) [wntchange]babubajar = 0 (4) [wntchange]modhubag = 0 chi2 (4) = 4.71 Prob.> chi2 = 0.318		Joint significance tests: (1) [wntchange]age10s = 0 (2) [wntchange]age30s = 0 (3) [wntchange]age40s = 0 (4) [wntchange]age50s = 0 (5) [wntchange]age60s = 0 chi2 (5) = 3.97 Prob.> chi2 = 0.553	
Result: Locations are not jointly significant.		Result: Age categories are not jointly significant.	
Here, *** implies significance at 1% level, ** implies significance at 5% level and *implies significance at 10% level Source: Own calculations.			

7.4 Limitations of the Study and Future Research Agenda

- 1) The number of secondary literature regarding rickshaw pullers of Dhaka city was found to be insufficient for this study.
- 2) A large sample size rather than 120 is required for further in-depth study of this important segment of urban informal sector.

7.5 Policy Suggestions

- 1) *Rickshaw Bank* can be introduced to provide small and medium enterprise loans with low interest rate to the rickshaw pullers (see Bose (2014)). This can provide loans for buying rickshaw and rickshaw safety management. Also this can introduce insurance policy to cover the loss of injury.
- 2) *New licenses* should be provided if it is helpful to reduce problems associated with illegal rickshaws.
- 3) Setting up *Skill Development Centers* in the rural areas can discourage rural-urban migration. To discourage the entry into rickshaw pulling, *enterprise development* among the rural youths including banking facilities in the rural areas may help the situation. In addition, *skill development centers* can be mobilized to facilitate language and skill training to aspiring rural youths in order to send them for international migration.
- 4) Introducing *Accident Insurance Policy* and *Retirement Benefit Policy* for the rickshaw pullers with the government support and with the help of development agencies can facilitate in improving their current vulnerable situations (can be done within the framework of policy suggestion no. 1).

8 Conclusion

Rickshaw pulling is a most popular informal profession in Dhaka. Cash income and quick engagement pull a number of populations to join this arduous occupation. This profession does not need education and skill so people are absorbed quickly in this sector. Moreover, there exists demand in the urban transportation sector which is fulfilled by these people. Among the young rickshaw pullers, there is a tendency of changing the career to improve their living standard which is seen in the study. Some of these respondents come in this profession because of extreme poverty. Some of them come for making instant cash income. Nonetheless around 800,000 people are estimated to be associated with rickshaw pulling in Dhaka (with family members, this implies a total of three million poverty-stricken persons). This sector should not be neglected by the government. To uplift their socio-economic condition the government and non-government organizations can take some necessary steps, one can be setting up **youth skill training centers** in the rural areas, particularly in the laggard, climate change-vulnerable as well as natural disaster-prone areas. In association with specialized banking facilities, rural unemployed youths can be trained for being entrepreneurs and be prepared for placements in the international labor markets.

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Annex

Image 1. Bangladeshi Cycle Rickshaw (source: collected from the internet)



Image 2. Cycle Rickshaw Pullers in Dhaka city (source: collected from the internet)



Image 3: Diagram exhibiting Livelihood Strategies of the Cycle Rickshaw Pullers of the Dhaka City

