REGENERATION OF THE HAZ ARIBAGH URBAN BROWNFIELD, HEALTH CONDITION OF TANNERY WORKERS, MECHANIC WORKERS, CLEANERS AND FISH SELLERS IN DHAKA, BANGLADESH

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Abstract— Bangladesh is a low lying riverine country. Ever since the early industrialization of Bangladesh, leather processing industries have played an important and noteworthy economic role. In Dhaka city, these industries are mainly concentrated in Hazaribagh, an important area in the southwestern part of the city which acts as a junction point connecting the new town with the old town. But unfortunately, the use of inferior technologies, coupled with the absence of proper industrial waste-treatment facilities and waste-management have destroyed the ecology of the Hazaribagh area and badly impacted its surroundings also. Apart from these, the health condition of workers and resident people are not up to the mark in Hazaribagh area. For this reason, shifting of tanneries from Hazaribagh and enlargement of this area after relocation will be a monumental opportunity for sustainable urban brownfield development movement. This study points to investigate not only the present thrash environmental condition but also health condition of the workers in Hazaribagh areas, and overall physical health condition of mechanic workers, cleaner and fish sellers in Azampur(Uttara) and Azimpur in Dhaka city. This present study also includes the projected aftermath of the decision taken by the Bangladesh government to impel Hazaribagh tanneries outside Dhaka. Regeneration of urban Hazaribagh brownfield can act as a model for 21st sustainable region that integrating all the cutting-edge technological facilities and environmental friendly methodologies, free from the severe pollution.

Index Terms— leather processing, Dhaka city, brownfield development, ecology, fish seller, mechanic worker, cleaner, physical health, regeneration.

I. INTRODUCTION

Dhaka, the capital of Bangladesh, is one of the most densely populated cities in the world. The huge population of Bangladesh causes a great damage on urban land and also deteriorates the quality of life and environment of the city. Such densification tendencies will also place pressure on large cities infrastructure and facilities. A 2014 United Nations report projected that Dhaka will become the sixth most crowded city by 2030, with a population of 27.37 million. Ever since the early industrialization of Bangladesh, leather processing industries have played a predominant and significant economic role. In Dhaka, these industries are mainly located in Hazaribagh, an important part of the city. A total of 270 tanneries, which comprises 90% of the tanneries in Bangladesh (Blacksmith Institute, 2007), differentiate Hazaribagh as the country's principle leather-processing zone. But the poor technological facilities provided by leather industries and worst waste treatment facilities and waste management facilities have dismantled the environment of Hazaribagh area which affect the worker health also. So moving tanneries from Hazaribagh to another location and then renovate the area will be a considerable opportunity in the country's sustainable urban regeneration.

II. HAZARIBAGH TANNERIES

In Hazaribagh some tanneries are on the street and some others tucked down side alleys which are covered by 50 acres of Hazaribagh area. They are most brick-walled factories, with small windows of broken glass. Running beside the factories are open gutters full of non-transparent blue-grey water. Many tanneries in Hazaribagh are multi-story buildings. Raw hides are often processed into "wet blue" leather in big size wooden drums and pits on the ground floor, before they are taken upstairs for drying and further processing with heavy machinery. The facilities of these factories are in impecunious condition and the ventilation system is adversely poor.

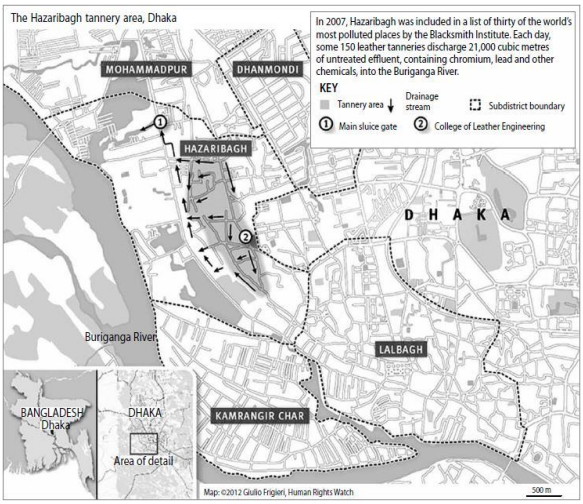


Fig. 1 Location of the Hazaribagh brownfield in Dhaka (Human Rights Watch, 2012).

III. OBJECTIVES OF THE STUDY

General objectives:

This study is conducted to know the present dreadful environmental condition of Hazaribagh area and overall health condition of tannery worker in Hazaribagh area, overall health condition of mechanic worker, cleaner and fish seller in Azampur (Uttara) and Azimpur in Dhaka, Bangladesh.

Precise objectives:

1) To understands the present alarming condition of Hazaribagh area.

2) To find out the suffering and poor health condition of mechanic worker, cleaner and fish seller in Azampur(Uttara) and Azimpur in Dhaka and tannery worker in Hazaribagh area.

3) Making footway for future sustainable regeneration of Hazaribagh area and discuss the benefit of Brownfield redevelopment.

4) Overview the Bangladesh Gov. rules to impel Hazaribagh area outside Dhaka.

IV. METHODOLOGY

We conducted our study mainly in Hazaribagh area. Apart from that we also did survey in Azampur(Uttara) and Azimpur. All the areas are from Dhaka District. As subject for the present study a total 360 (150 tannery workers, 50 cleaners,60 fish sellers and 100 mechanic worker) respondents were selected. Most of the respondents were illiterate and some of the respondents were unmarried and their educational background was class Four to HSC. All participants were come from middle class and low middle class family. Their age range was 12-70 years and their average monthly income was 5000-17000 taka.

Measuring factors:

1) Questionnaire about overall health &
2) Physical health questionnaire

For collecting the data, the second and third author visited the Hazaribagh tanneries. They took formal permission from the authority before collecting the data. Then they gave the questionnaire to the workers and the workers were asked to response and fill the questionnaire without any hesitation. They were friendly and very responsive. In this simple way the data was collected from the workers in Hazaribagh area. The same way also applied in Azimpur and Azampur(Uttora) for collecting data from mechanic worker, cleaner and fish sellers.

VI. DATA ANALYSIS AND FINDINGS

A. Symptom of Gastrointestinal problem:

Table I Symptom of Gastrointestinal problem

Gastrointestinal (Overall)		
Gastrointestinal problem		None
26.00 %		74.00 %
Single Gastrointestinal Symptom	Multiple Gastrointestinal Symptom	
20.92 %	5.08 %	

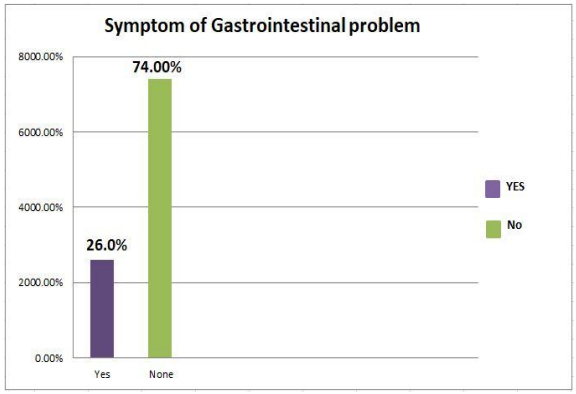


Fig. 2 Percentage of gastrointestinal symptoms

Table II Percentage of Gastrointestinal Problem

Gastrointestinal					
Nausea or vomiting		Frequent diarrhea		Stomach/ abdominal pains or heartburn	
Yes	No	Yes	No	Yes	No
1.85 %	98.15 %	3.85 %	96.15 %	2.44 %	97.56 %

B. Cardiovascular Symptoms:

Table III Prevalence of cardiovascular symptoms

Prevalence of Cardiovascular Symptoms (CVD)	
CVD Patient	None

22.00 %		78.00 %
Single CVD Symptom	Multiple CVD Symptoms	
19.25 %	2.75 %	

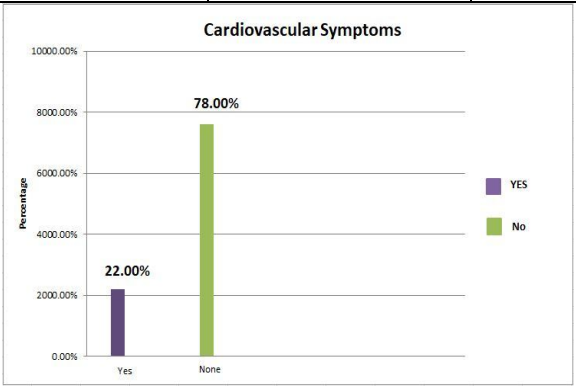


Fig. 3 Percentage of cardiovascular symptom

Table IV Percentages of cardiovascular symptoms

Core idea	Explanation
Contamination-related concern	Multidisciplinary long-term studies, gradual regeneration de-escalates risks and boosts accuracy
Political and institutional concern	A clear-cut and compatible policy on brownfield regeneration and administrative incentives.
Legal concern	Framework legislation
Economic concern	Tax-based economic enticement
Plan/design-based concern	A city-wide database system for brownfields that governed the planning scale, a robust guideline.

C. Symptom of Oral Health Problem:

Table V Number of participant's symptom of Oral health problem

Oral Health		
Oral Health problem		None
3.00 %		97.00 %
Single Oral Symptom	Multiple Oral Symptoms	
2.44%	0.56 %	

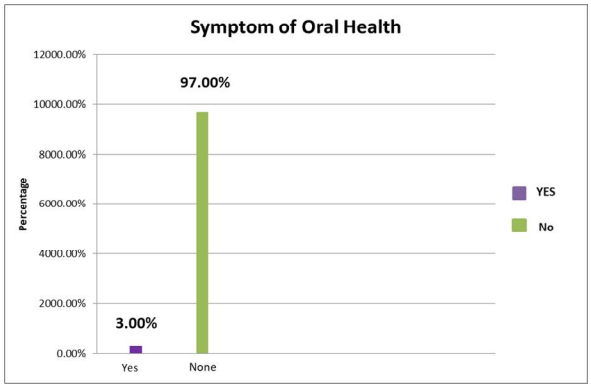


Fig. 4 Symptom of oral health

D. Footway towards sustainable Brownfield Regeneration

Table VI The major benefits Brownfield redevelopment

Percentage CVD Symptom (overall)					
Heart trouble		Shortness of breath, walking or lying flat		Swelling feet, ankles or hand	
Yes	No	Yes	No	Yes	No
2.44 %	97.56 %	1.735 %	98.265 %	0.13 %	99.87 %

VII. BANGLADESH GOV. RULES

According to Bangladesh Environment Conservation Act, 1995 (Bangladesh Gazette 1995, Statutory Instrument, no. 1/1995) and the Environment Conservation Rules, 1997 (Bangladesh Gazette 1997, Statutory Regulatory Order, no. 197-Law/97):

2) Industrial units which are heavy polluted and toxic and also responsible for the pollution shall not be allowed to be located in any residential area.

3) Industrial units those are likely to produce smoke, noise and odors beyond the permissible limit shall not be tolerable in commercial areas.

High court ruled in 2009 that the government should ensure that the tanneries relocate outside of Dhaka.

Table VII Footway towards sustainable Brownfield regeneration

Remediation (Environmental presentation)	Revitalization (Social presentation)	Reintegration (Economic presentation)
1. Secure biodiversity 2. Upgrades air quality 3.Decrease storm water runoff 4.Lessen greenhouse gas emissions	1.Introduces more integrated community involvement 2.Cuts down long-term risks to human health 3.Ameliorates the quality of life	1.Protect land value 2.Minimizes energy consumption cost 3.Expand employment and investment rate

VIII. DISCUSSION AND RECOMMENDATION

Propose and recommendation:

Based on the results and findings of the study the following recommendations are made:

1) In case of soil remediation and waste water management in Hazaribagh area, a robust and accurate method should be picked up. For example: Soil excavation.

2) Environmental cleanup strategy plan should be made for regeneration in Hazaribagh area for decodes the problem.

3) The interior set up of industry hegemonies the health problem of workers. The physical asset is main consideration for the worker. Because they invest it in order to achieve better lives. Sufficient health and safety opportunities, health insurance for the workers and creating a healthy environment for the workers are needed.

4) Increasing awareness among workers to maintain a good health, improve the environment of the place where they work and live are recommended if we want good health condition of tannery worker, fish seller, cleaner and mechanic worker in Bangladesh.

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