



2nd World
Sustainability Forum

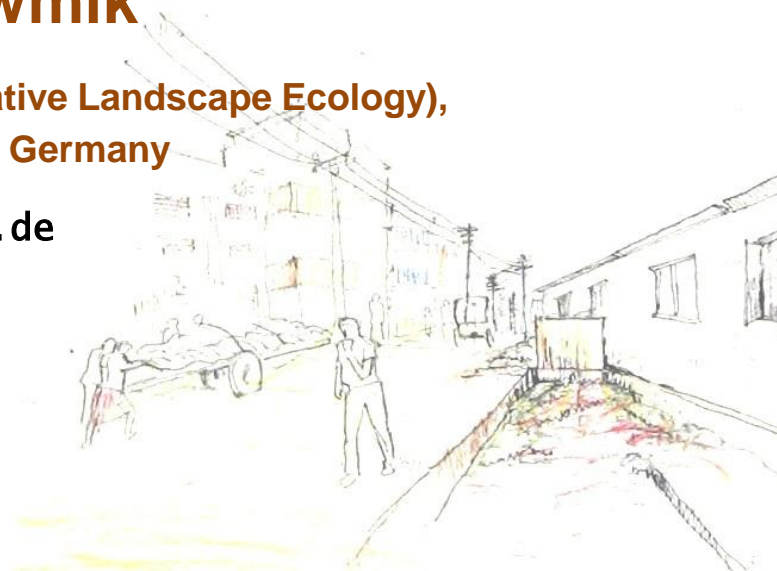
1-30 November 2012

Environmental Sustainability Vs. Political Decision: A Review of the Bangladesh Leather Processing Industry Relocation Plan

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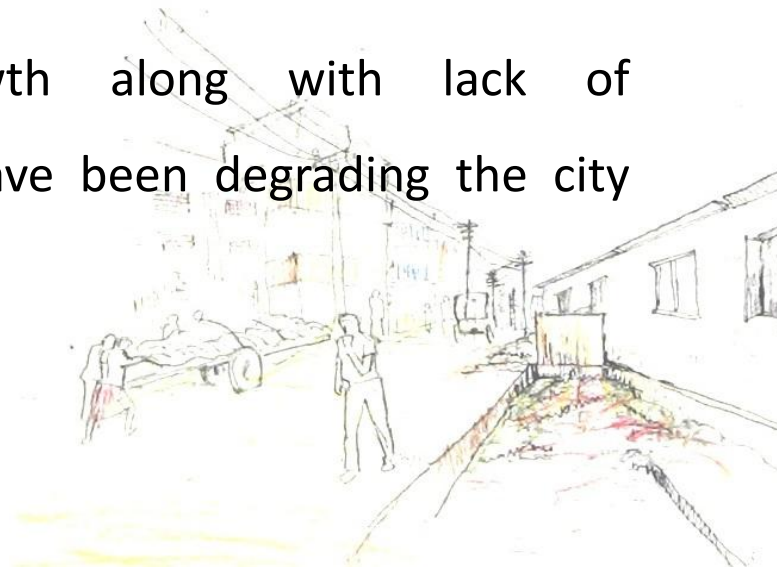
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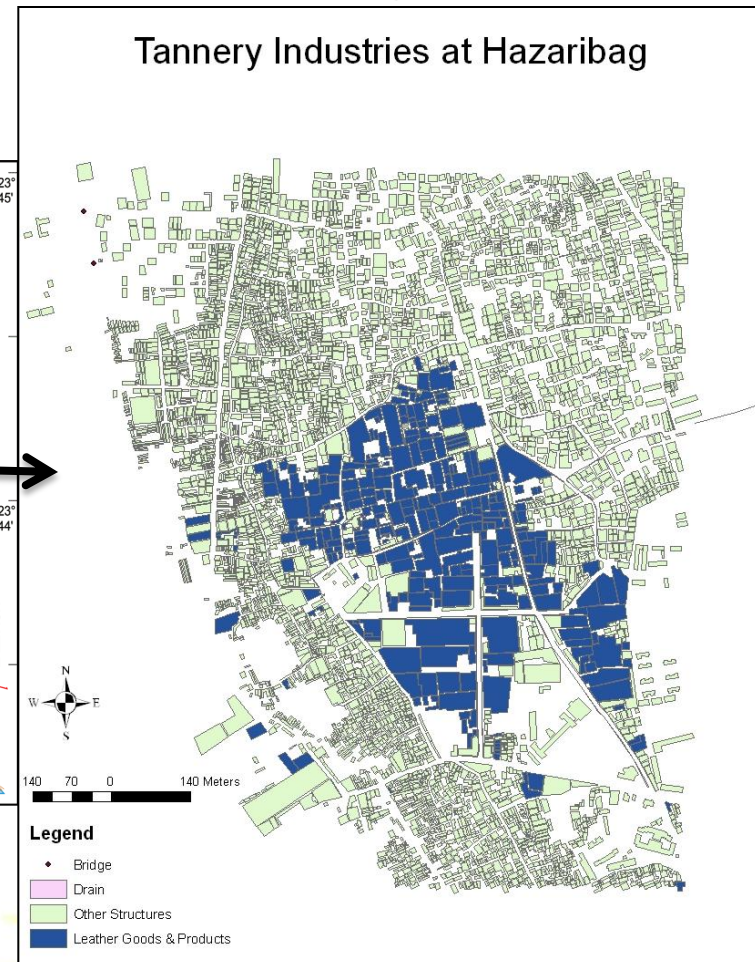
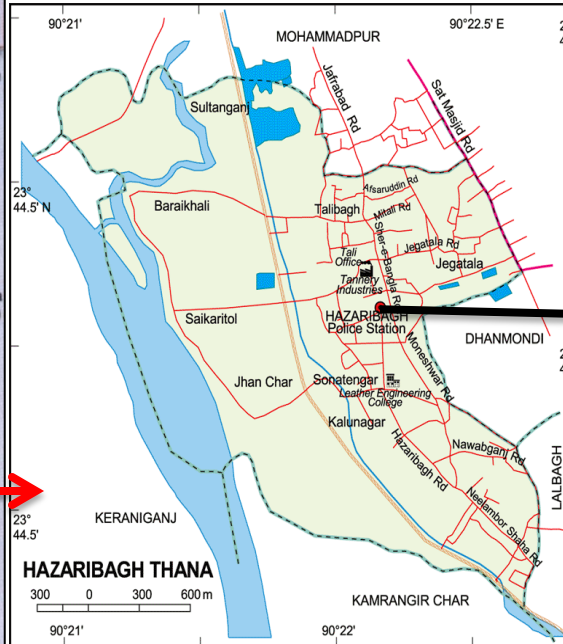
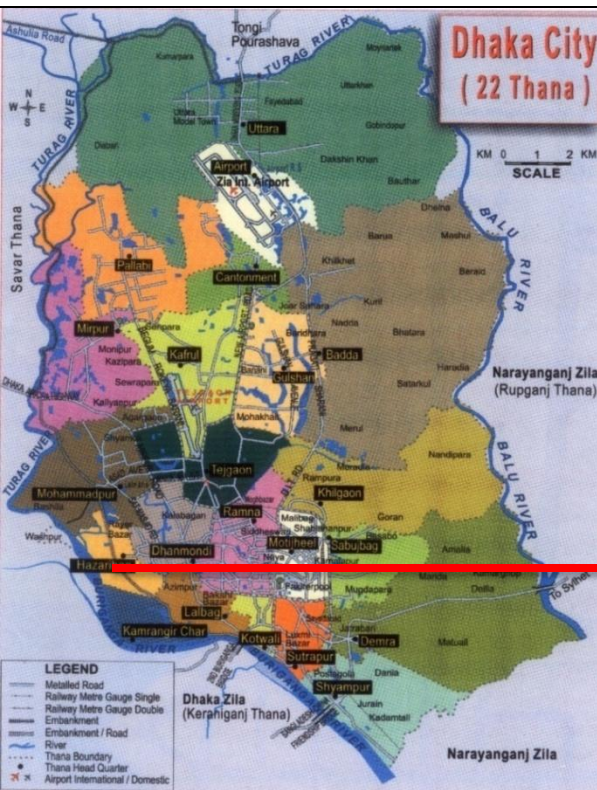
Leather Processing Industry

- One of the oldest industries in Bangladesh, flourished along the river bank of Buriganga in the capital Dhaka.
- Migration of leather processing activity from the developed to the developing countries fostered the growth.
- Total export of the footwear and manufactured leather goods during 2008-2009 is **\$250 million** and it shares **1.83%** of the national GDP.
- Unplanned and uncontrolled growth along with lack of environmental protection measures have been degrading the city environment of 16 million people.



Hazaribagh Tanneries

- Leather processing industry is locally known as *Tannery*.
- **95%** of the tanneries of Bangladesh are located in Hazaribagh - **249**.



Degraded Living Environment



Degraded Living Environment

- Physiochemical composition of soil at four stations

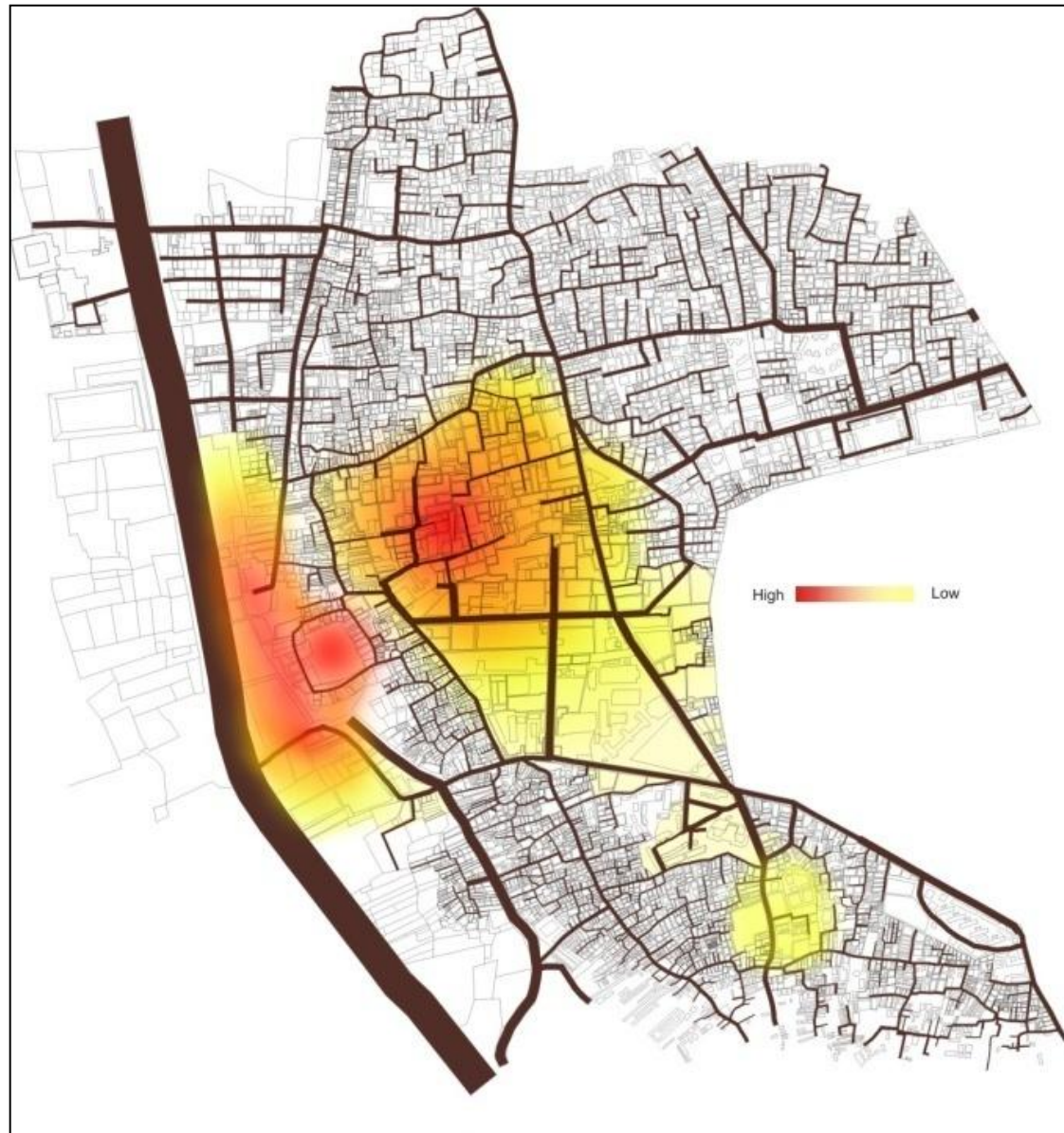
Station	pH		Organic Matters %	Exchange Capacity dS/m	Cation Exchange Capacity meq/100g	Each Cation meq/100g				Cl mg/l	Available Content ppm		
	S/E	CaCl ₂				Ca	Mg	K	Na		N	P	K
	1	7.3	7.1	10.3	4.3	39.0	38.5	8.3	0.9	19.2	50.5	2343	5.7
2	7.3	6.9	1.5	4.5	7.0	8.5	1.9	0.3	3.9	64	280	1.1	98
3	7.3	6.8	1.2	3.9	8.4	5.8	2.1	0.4	3.0	69	245	3.3	145
4	7.0	6.6	0.5	0.4	29.0	6.3	2.0	0.4	1.5	6	26	0.6	31

- Physiochemical composition of water – average of 15 stations' measurements

pH	Total Suspended Solids mg/L	Biological Oxygen Demand	Chemical Oxygen Demand	Alkalinity mg/L	Chloride mg/L	Chrome total mg/L	Oil and Grease mg/L	Phenol Compounds mg/L	Sulphide mg/L
7.9 - 8.2	2000 - 3500	1000 - 1800	2400 - 4250	900 - 1600	5600 - 9500	60 - 150	50 - 125	10 - 15	75 - 180

Degraded Living Environment

- Index of Contamination



Tannery Relocation Project

- Hazaribagh Tannery Relocation Project (HTRP) - trilateral agreement of Bangladesh Small and Cottage Industries Corporation (BSCIC) under Ministry of Industries (Mol), Bangladesh Finished Leather, Leather Goods and Footwear Exporters Association (BFLLEA) and Bangladesh Tanneries Association (BTA) from 23rd October 2003.
- New site: Chandranarayanpur under Tetuljhara union of Savar thana beside Dhaleswari River.
- Area about 187.90 acre with another 200 acre for future expansion.
- Plot area is 134.46 acre, Road 38.31 acre, CETP 7.91 acre, landfill 7.22 acre.
- Total 195 plot categorized as A, B, C, D.



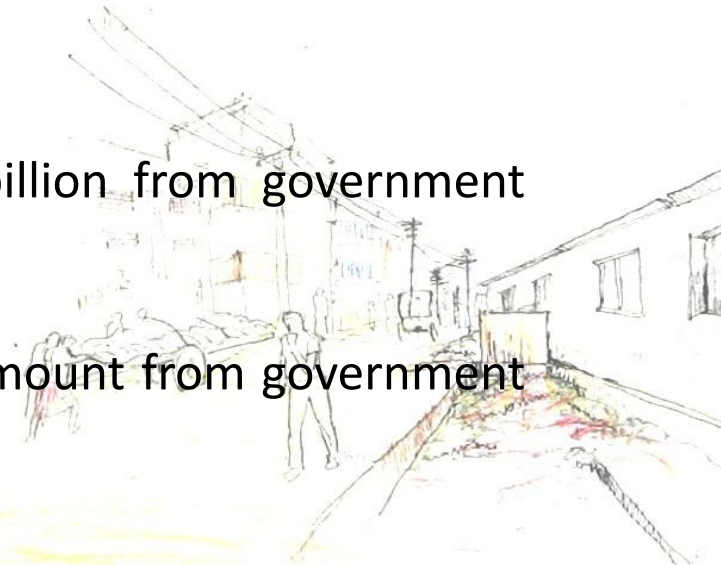
Tannery Relocation Project

- **Time**

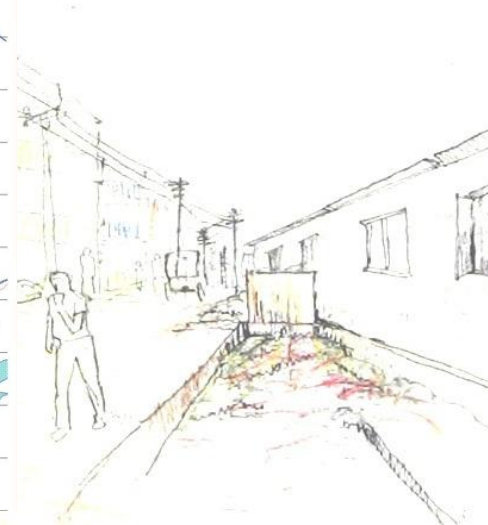
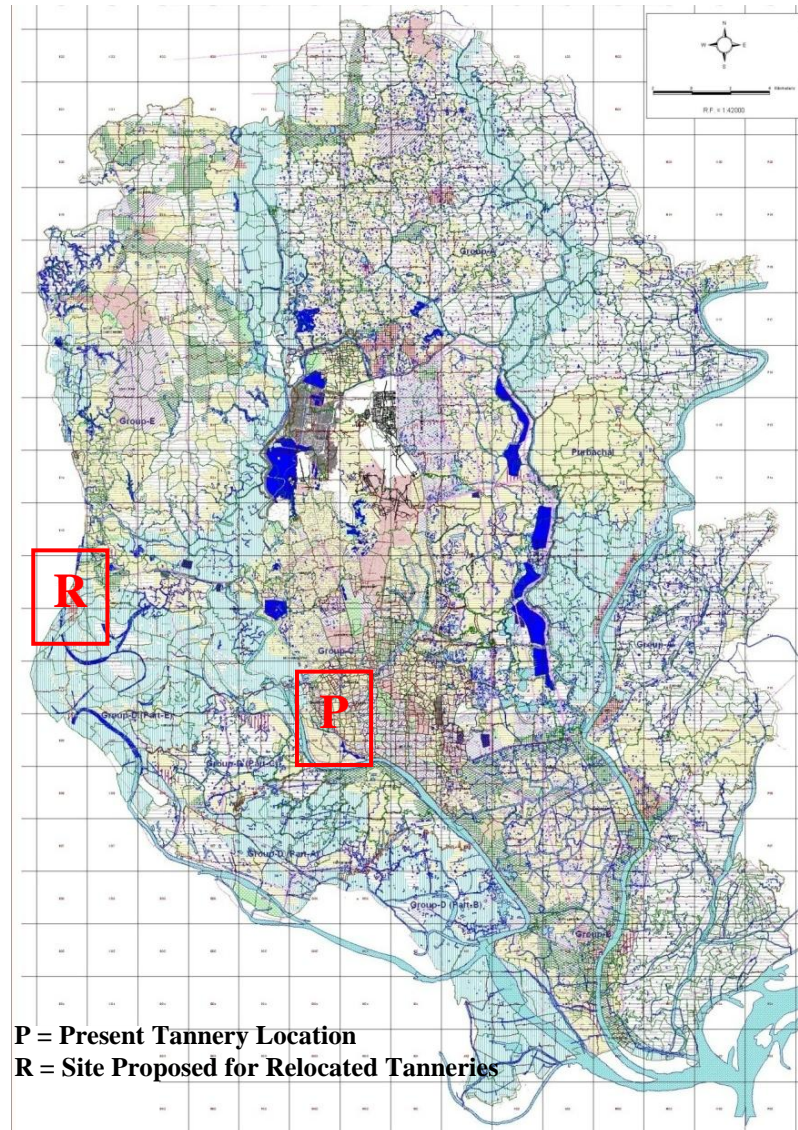
- Original time period: January 2003 to December 2005, revised as January 2003 to June 2010.
- High Court ordered to relocate by February 28, 2010.
- Minister for Natural Environment and Forests assured that the relocation can be finished by December 2012

- **Cost**

- Original Cost Tk. 1.75 billion (0.94 billion from government fund & 0.81 billion from project aid)
- Revised Cost Tk. 5.45 billion (Entire amount from government fund)

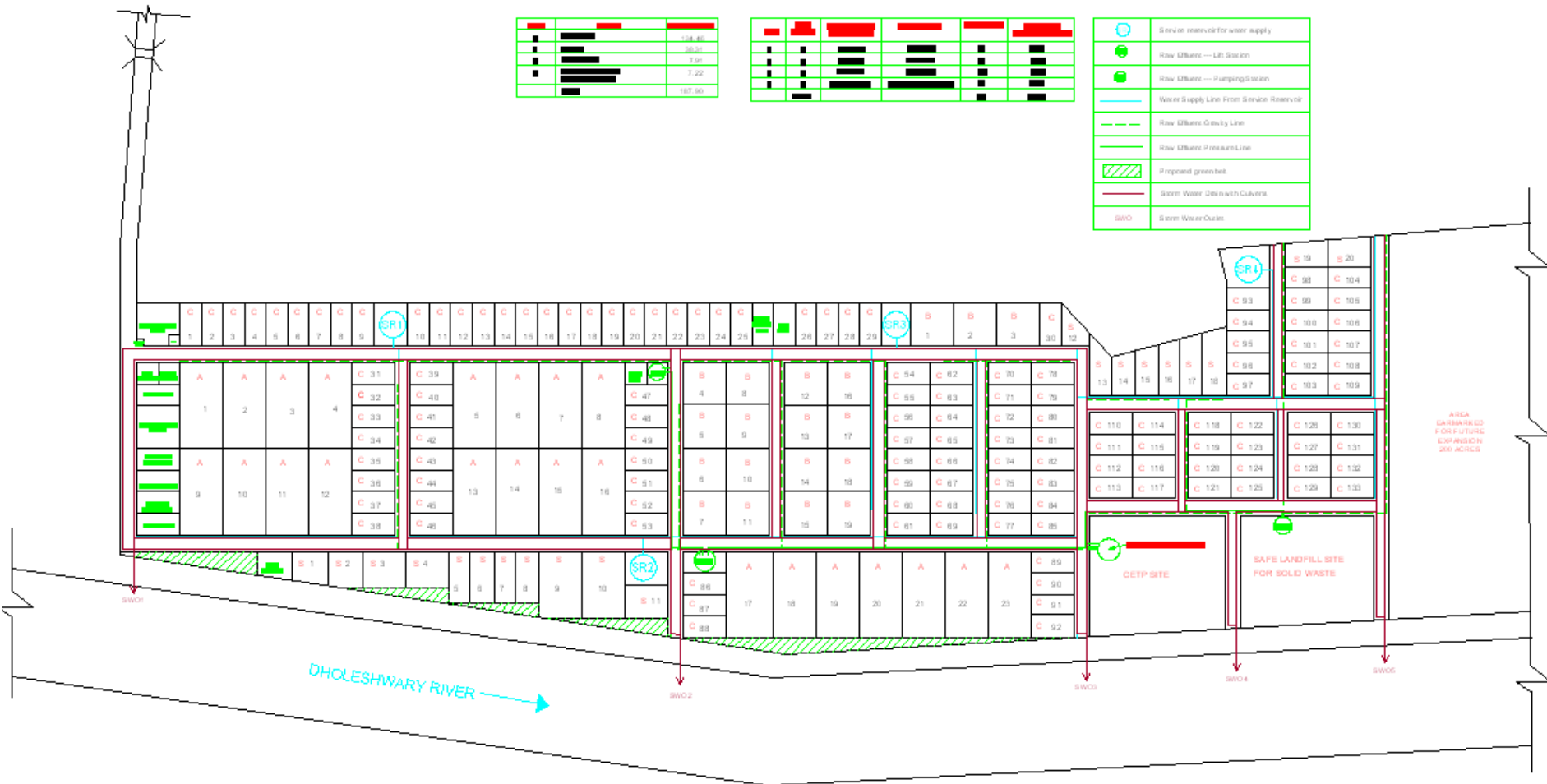


Tannery Relocation Project

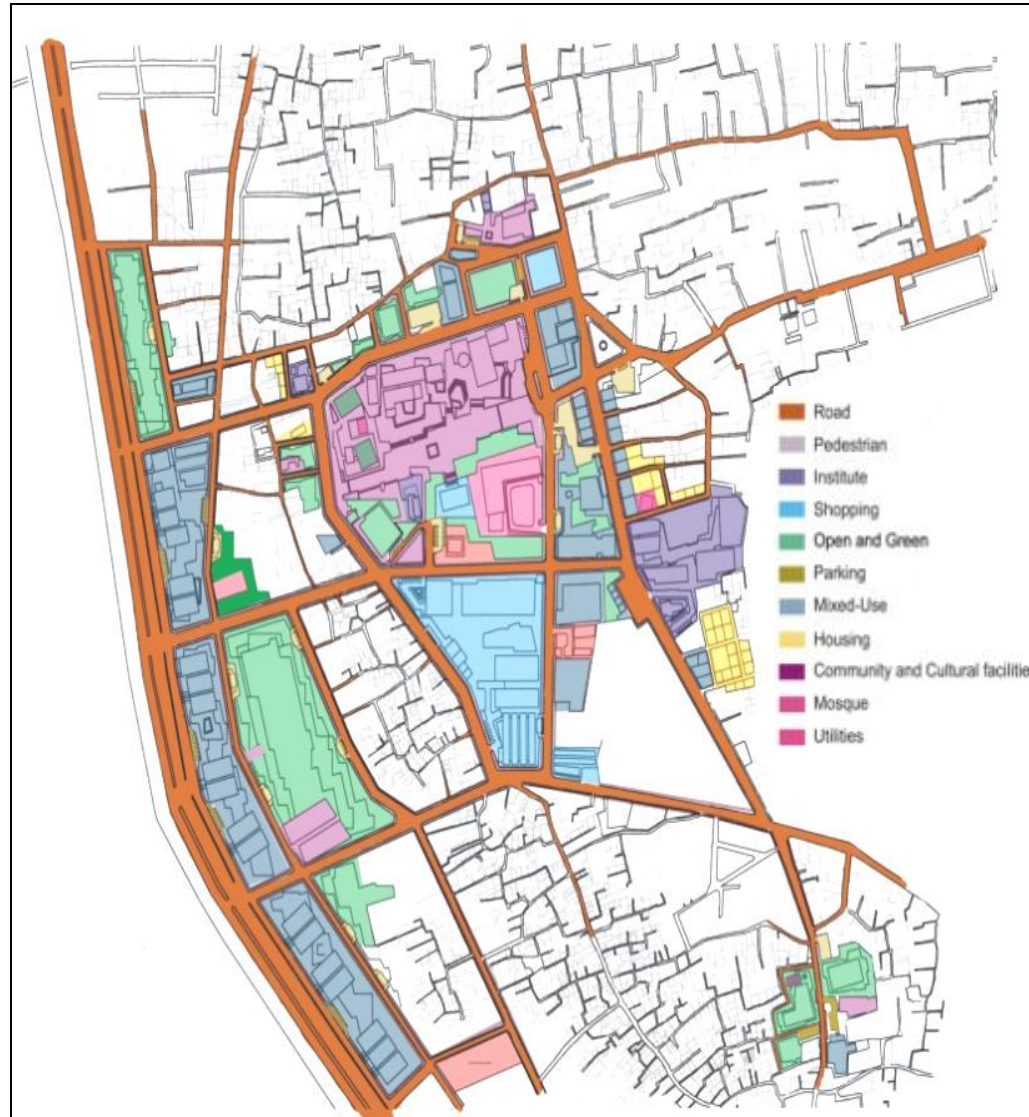


Tannery Relocation Project

PRELIMINARY LAYOUT PLAN OF TANNERY INDUSTRIAL ESTATE NEAR DHAKA



Development of Mixed Use Area in Hazaribagh



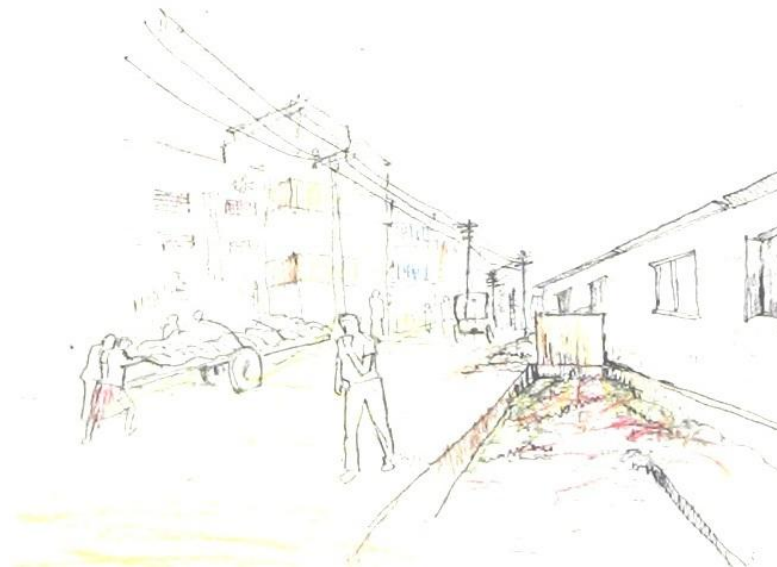
Research Objectives

- To analyze whether the successful accomplishment of the relocation project would ensure the environmental sustainability of the Dhaka city or not.
- To provide a viable recommendation for the location of the leather processing activity in Dhaka so that sustainability can be attained from social, economic and environmental perspectives.



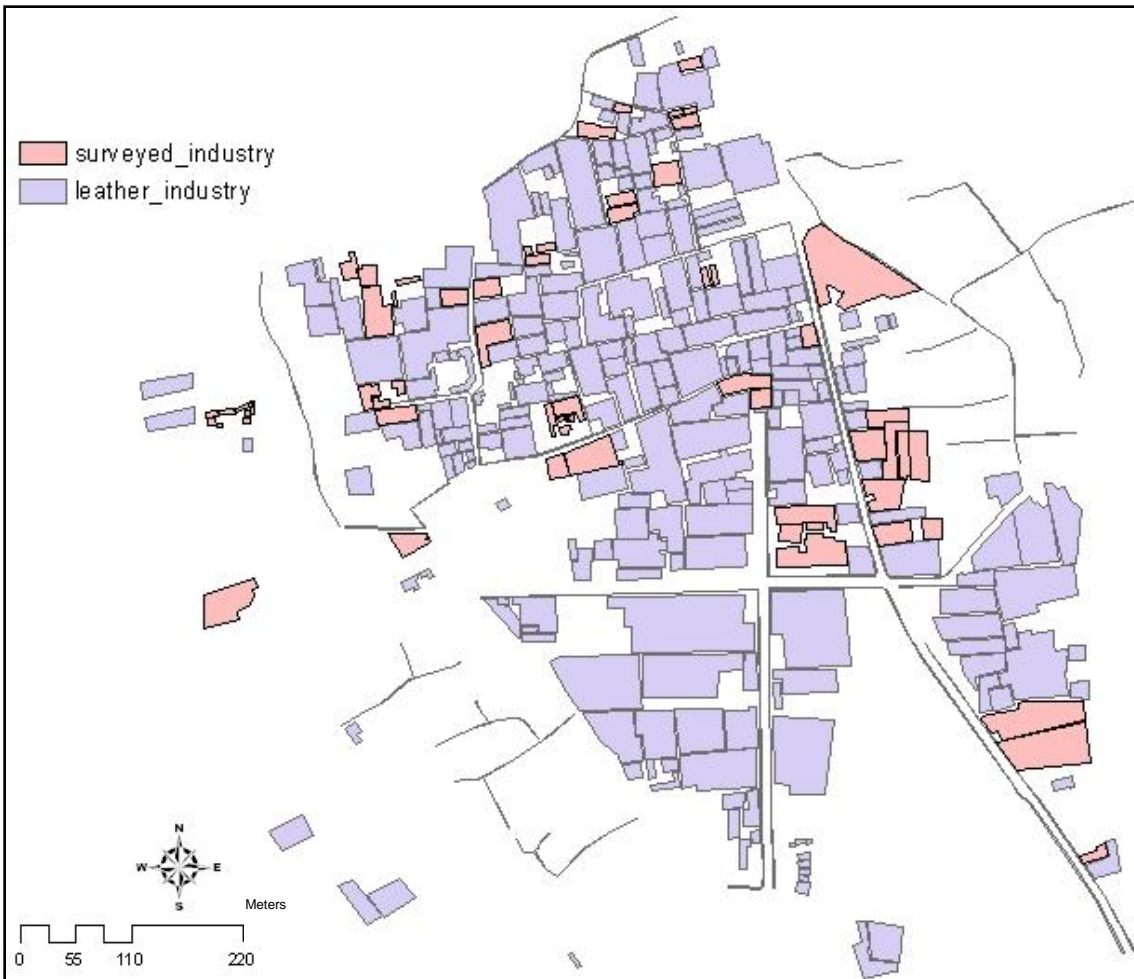
Methodology

- **Social Theories of the City**
 - Stake of the Tannery Owners in the location decision of the tanneries.
 - Harmony of Industrial Growth and City Expansion.
 - Assimilative Capacity of the Local Environment.

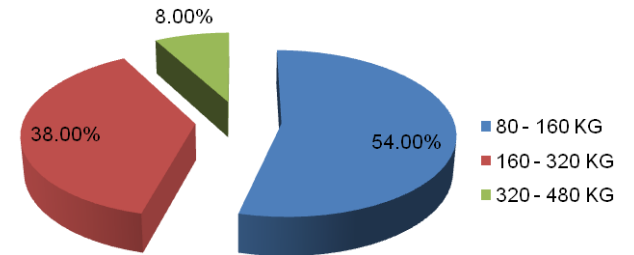


Methodology

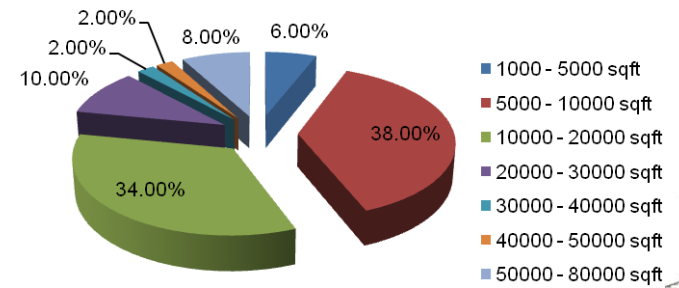
- Questionnaire Survey of the Tannery Owners



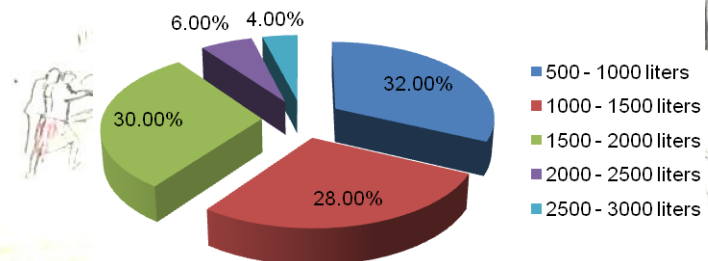
Solid Waste Disposal



Production Capacity

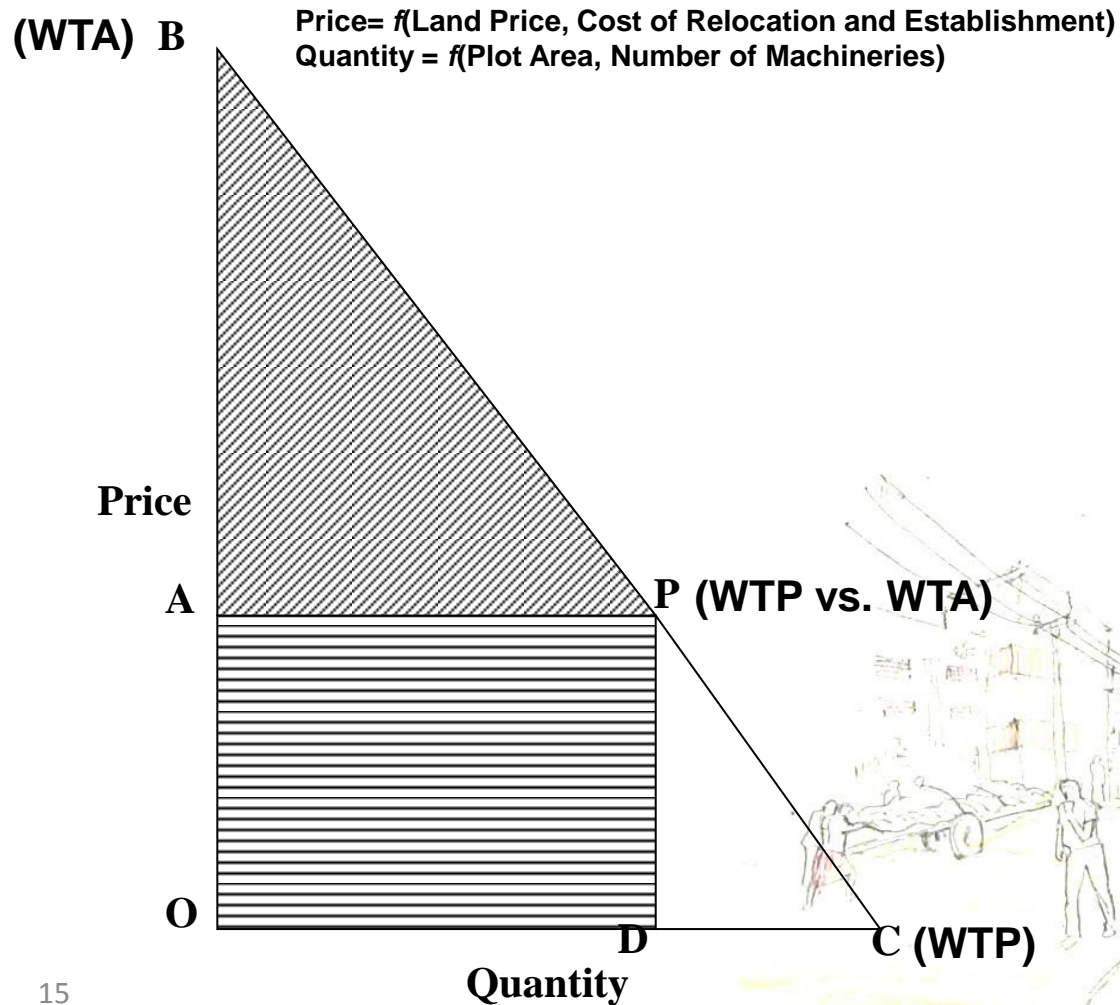


Liquid Waste Disposal



Methodology

- Willingness to Pay (WTP)



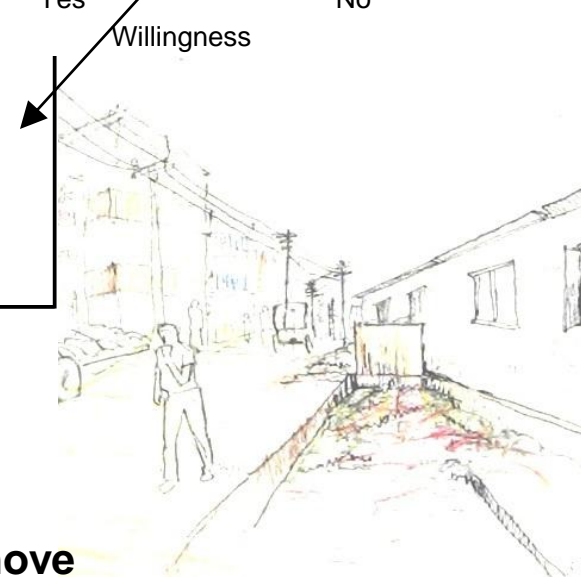
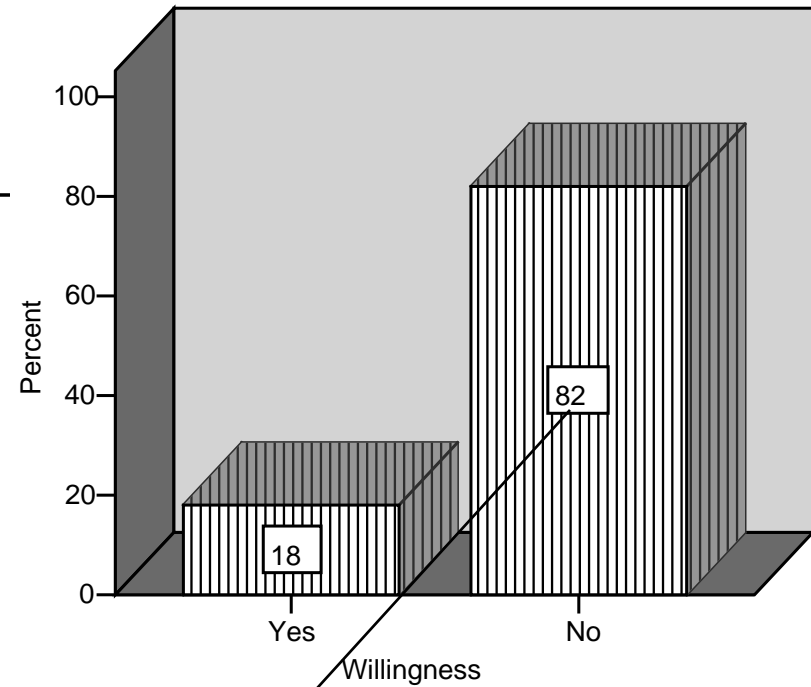
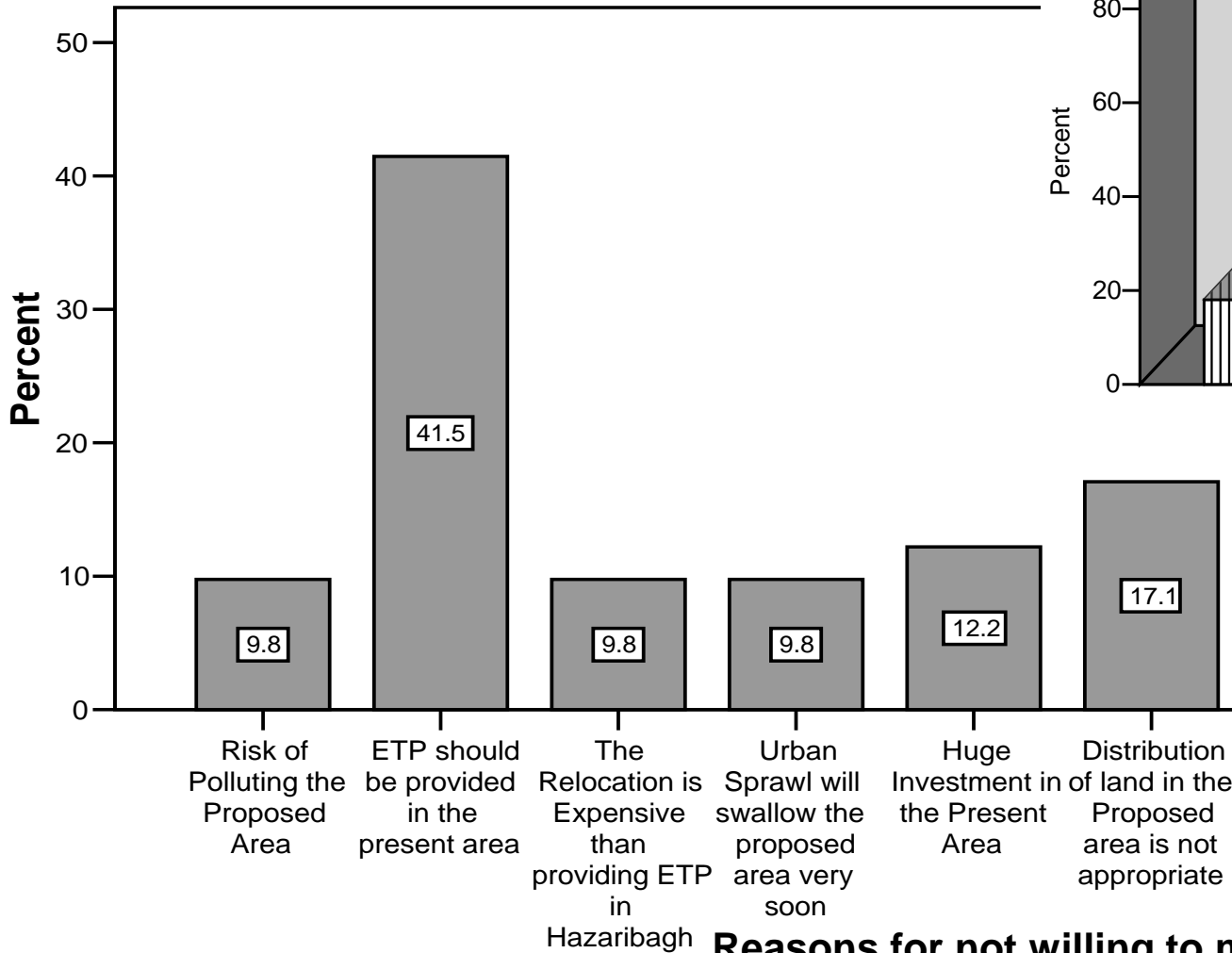
Methodology

- **Pigovian Tax**
 - A function of the total amount of goods and pollution produced from an industry.
 - The cost of reducing individual's exposure to a certain pollution form an industry.
- **Hedonic Price**
 - House price = f (Rooms, Access, **Environment**)



Urban Planning Justification

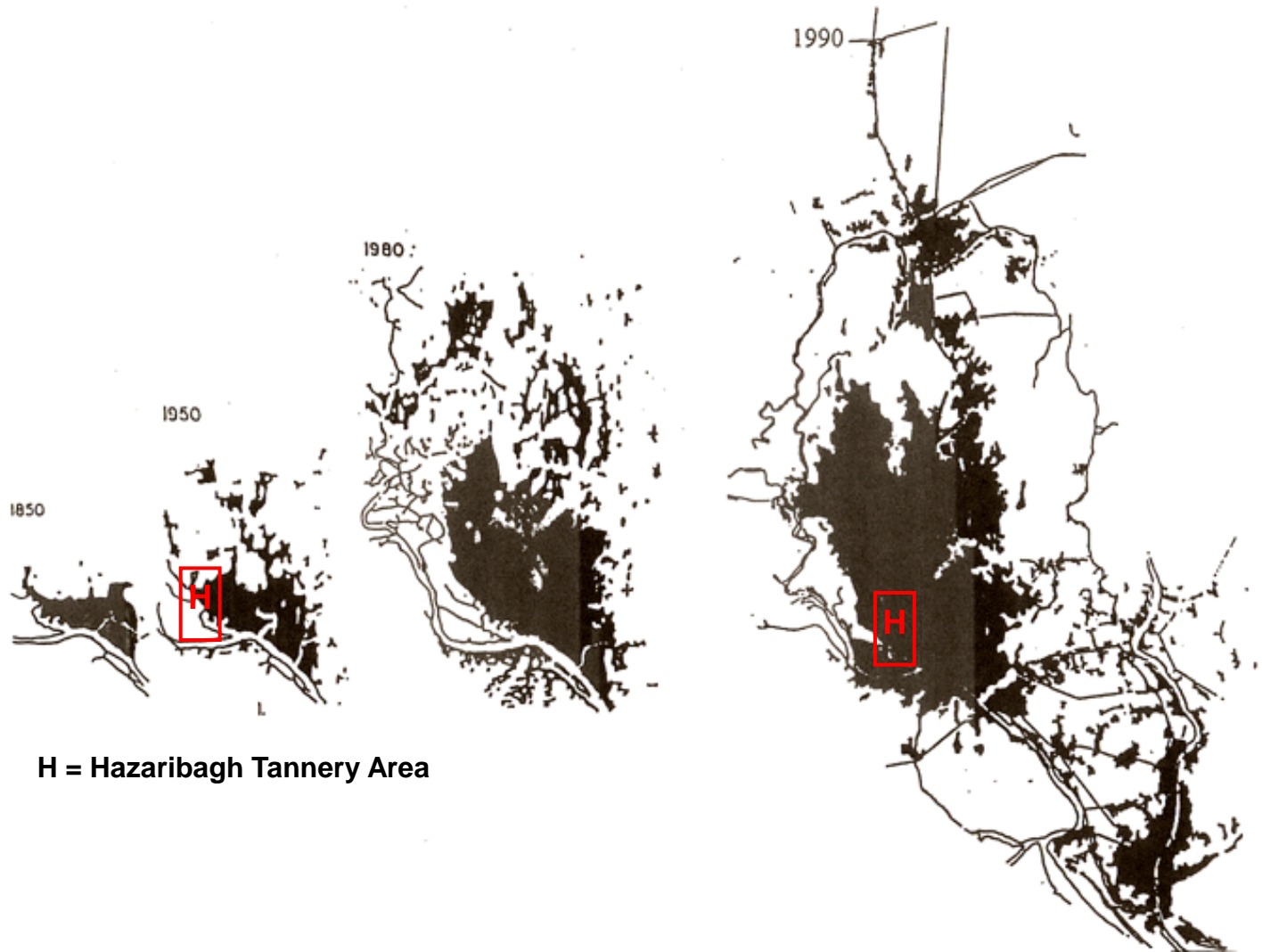
- **Willingness of Tannery Owners**



Reasons for not willing to move

Urban Planning Justification

- **Historic Growth Trend of Dhaka City**



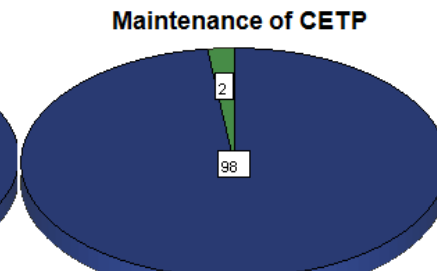
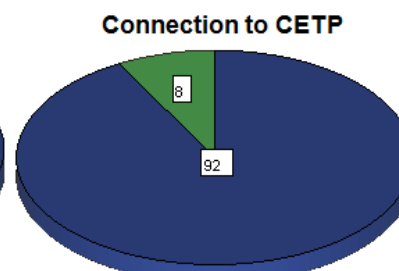
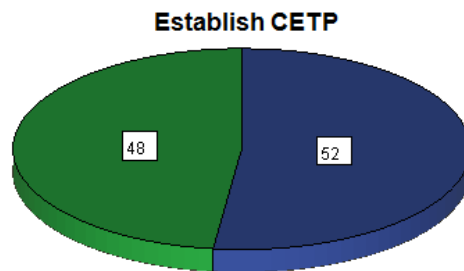
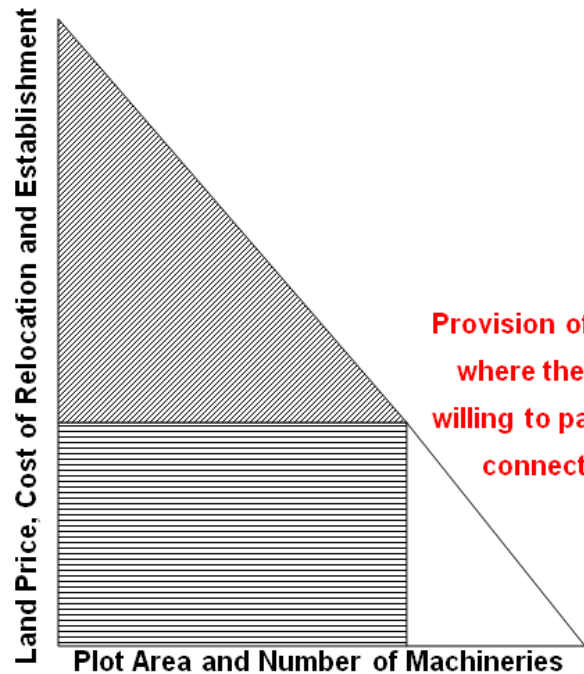
Urban Planning Justification

- Violation of Dhaka City Structure Plan



Environmental Economics Justification

- Willingness to pay of the Tannery Owners



■ Yes ■ No



Environmental Economics Justification

- Cost of Relocation and Redevelopment of Hazaribagh Tannery**

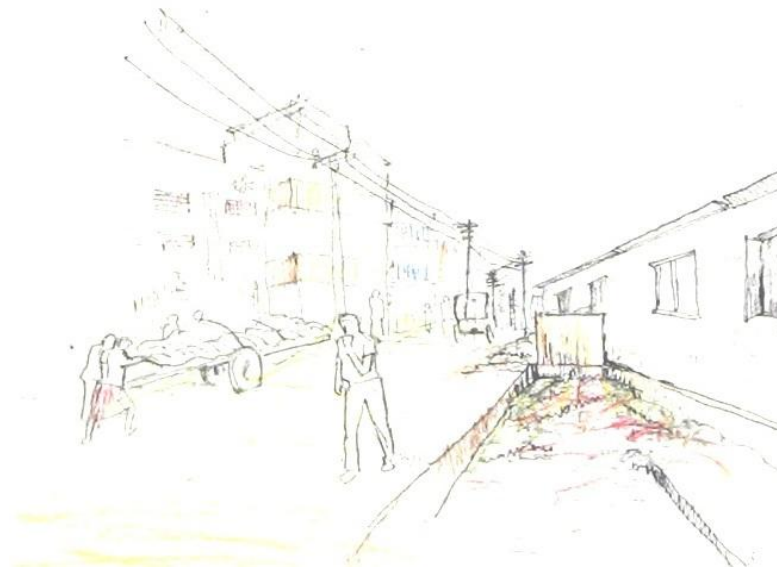
Subsidy and Compensation should be Provided in addition to the actual Relocation Project Cost Should be carried by the government			Redevelopment of Hazaribagh as an Environmental Friendly Leather Processing Zone Can be imposed as Pigovian Tax on the owners		
Component and Quantity	Unit Cost	Total Cost	Component and Quantity	Unit Cost	Total Cost
1. Drums and Pedals - 60 on average for each tannery	BDT 250000	BDT 3.74 billion	1. CETP and Landfill Site - 1	BDT 2.45 billion	BDT 2.45 billion
2. Reestablishment of Machineries – 20 on average for each tannery	BDT 200000	BDT 0.99 billion	2. Infrastructure Development – 31% of the Savar site	-	BDT 0.9 billion
3. Compensation on the investment at Hazaribagh – 50% of the present market value of the buildings	-	BDT 1.2 billion	3. Environment friendly tanning process in each industry	BDT 1783100 for each big tannery	BDT 0.22 billion
Total		BDT 5.93 billion	Total		BDT 3.57 billion



Environmental Economics Justification

- **Pigovian Tax**

*Pigovian Tax = BDT 2.45 billion + BDT 0.735 billion (annually) + **cost of any remediation for soil and water at Hazaribagh***



Environmental Economics Justification

- **Hedonic Price**

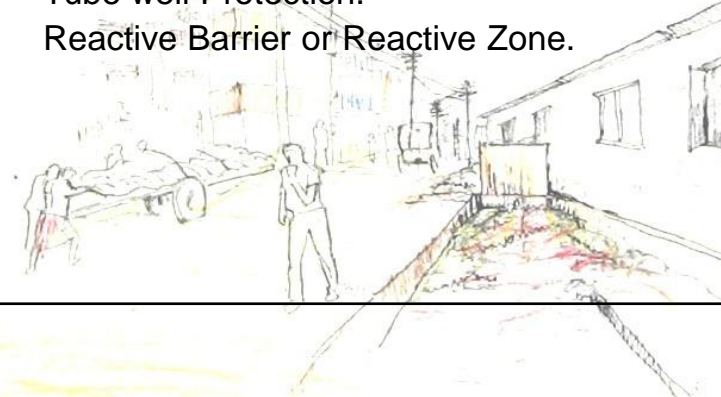
Remediation Procedure of Hazaribagh Soil and Water

Treatment of Hazaribagh Lagoons and Isolated Pollution Sources

- Removal of superficial wastes - sludge in lagoons and wastes on dump sites.
- Excavation of the visible soil pollution - buried wastes, organic soils.
- Excavation of the rest of the soil pollution -based on chemical analysis.
- Covering the soil with a concrete layer or a foil.
- Removal of several meters of topsoil as a remediation work before constructing new buildings.
- For deeper soil layers, in situ techniques that treat the contamination in place.

Restriction on uses because of the diffused Pollution Sources

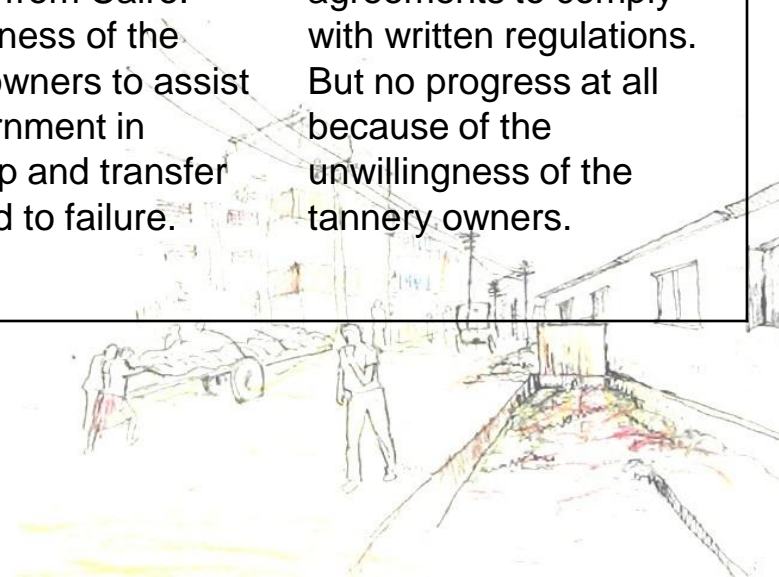
- Restriction to grow vegetables on the site.
- Restriction to use groundwater for drinking.
- Restriction to pump groundwater.
- Restriction to live on some parts the site.
- Restriction to enter some parts of the site.
- Tube well Protection.
- Reactive Barrier or Reactive Zone.



Relocation is not Justified

- Relocation of Leather Processing Industries failed worldwide

Country	India	Egypt	Mexico
City	Tamil Nadu	Cairo	Leon
Number of Tanneries	577	320	675
The River Polluted	Palar	Nile	Gomez
Causes of Failure of Relocation Projects	Involves the movement of thousands of families, settlements and machines. But ultimately got a hunch back by Supreme Court because of appeals from social communities including tannery owners.	US\$ 150 million project in a desert location 70 km away from Cairo. Unwillingness of the tannery owners to assist the government in ownership and transfer issues led to failure.	Only managed to sign a number of voluntary agreements to comply with written regulations. But no progress at all because of the unwillingness of the tannery owners.



Relocation is not Justified

The leather processing industries will be relocated to the proposed Savar tannery complex

- Attempts in the similar context failed in India, Egypt and Mexico
- Violation of the Dhaka Structure Plan, flood hazard will be increased
- Upstream location will put the entire surface water in risk
- The owners are not willing to pay and relocate
- The Pigovian tax cannot be imposed
- The Hedonic price of redevelopment for alternative uses is too high

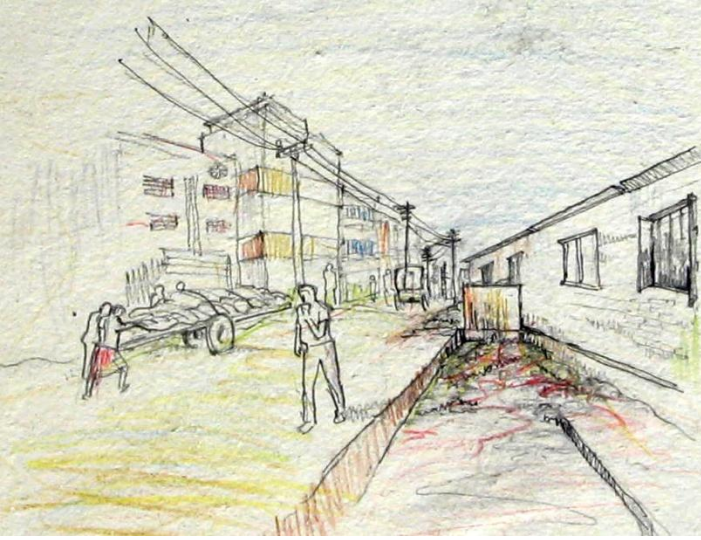
Environmental Sustainability

X

The CETP and the Landfill Site will be established at Hazaribagh

- Attempt proposed in the similar context in India, Egypt and Mexico
- According to the Dhaka Structure Plan, flood hazard will be tackled
- Downstream location, therefore safe for the upstream water sources
- The owners are willing to pay for CETP operation and maintenance
- Government can legally impose the Pigovian tax
- The Hedonic price for environment friendly tanning is minimal





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Thank You

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