Ijaz Hossain
Chemical Engineering Department, BUET

IS RESOURCE EFFICIENCY A CHALLENGE OR OPPORTUNITY FOR SMES?

HOW IS A SME DEFINED?

According to the EU Commission's definition, whether a company qualifies as an SME is determined by the factors headcount and turnover or balance sheet total.

The Commission counts companies with **less than 250 workers** and a turnover of less than 50 million euro annually as SME.

Companies with a balance sheet total of more than 43 million euro do not qualify as SME.

SME DEFINITION IN BANGLADESH

Bangladesh Bureau of Statistics (BBS) uses a definition of size based on ‘employment size’.

Establishments employing between **1 and 9** workers are called **‘micro’;**

Establishments employing between **10 and 49** workers are called **‘small’**;

Those employing between **50 and 99** workers are called **‘medium’;**

Those employing **100 or more** workers are called **‘large’.**

SME SUPPORT SCHEMES IN THE UK

The two major SME support schemes active in the West Midlands, UK

EnviroINNOVATE offers support for SMEs to innovate and exploit environmental technology.

Envirowise is a UK-wide team of independent, qualified and experienced advisors who offer a free, confidential half-day visit for company-specific guidance; (a) to help save money through waste minimisation and resource efficiency ('FastTrack'); (b) to reduce the environmental impact of a product over its lifecycle.

Tim Woolman, Alireza Veshagh
Warwick Manufacturing Group, University of Warwick, UK

DESIGNING SUPPORT FOR MANUFACTURING SMES APPROACHING ECO-DESIGN AND CLEANER PRODUCTION - LEARNING FROM UK SURVEY RESULTS

Tim Woolman, Alireza Veshagh

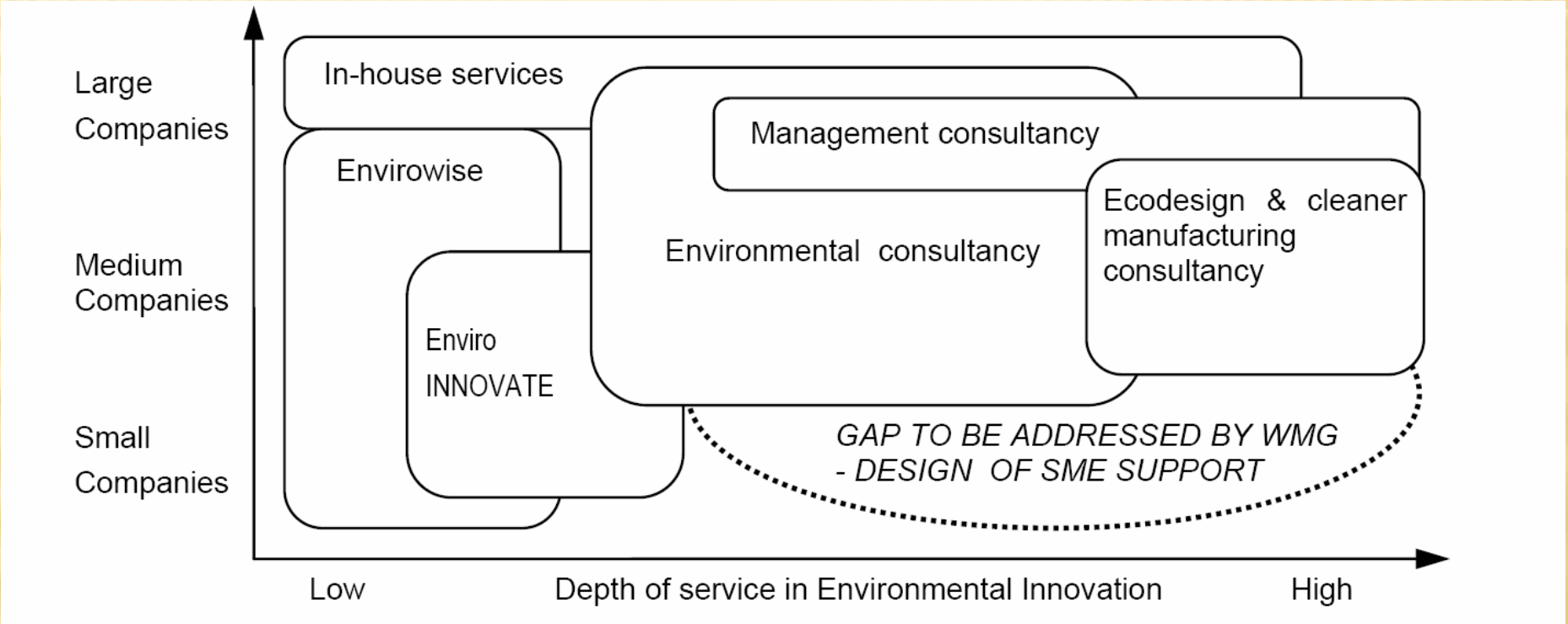
Warwick Manufacturing Group, University of Warwick, UK

Proponents of ecodesign and cleaner production have had mixed success in penetrating small and medium sized manufacturing companies in the UK.

Existing schemes, such as Envirowise and EnviroINNOVATE in the West Midlands, typically **rely on external funding** and **leave a gap in provision for deeper intervention in smaller companies**.

Design criteria for effective support of these smaller manufacturers are presented based on an understanding of drivers, barriers and enablers for cleaner manufacturing from four surveys of UK SMEs.

SIZE OF COMPANY VS. INNOVATION CAPACITY



Tim Woolman, Alireza Veshagh
Warwick Manufacturing Group, University of Warwick, UK

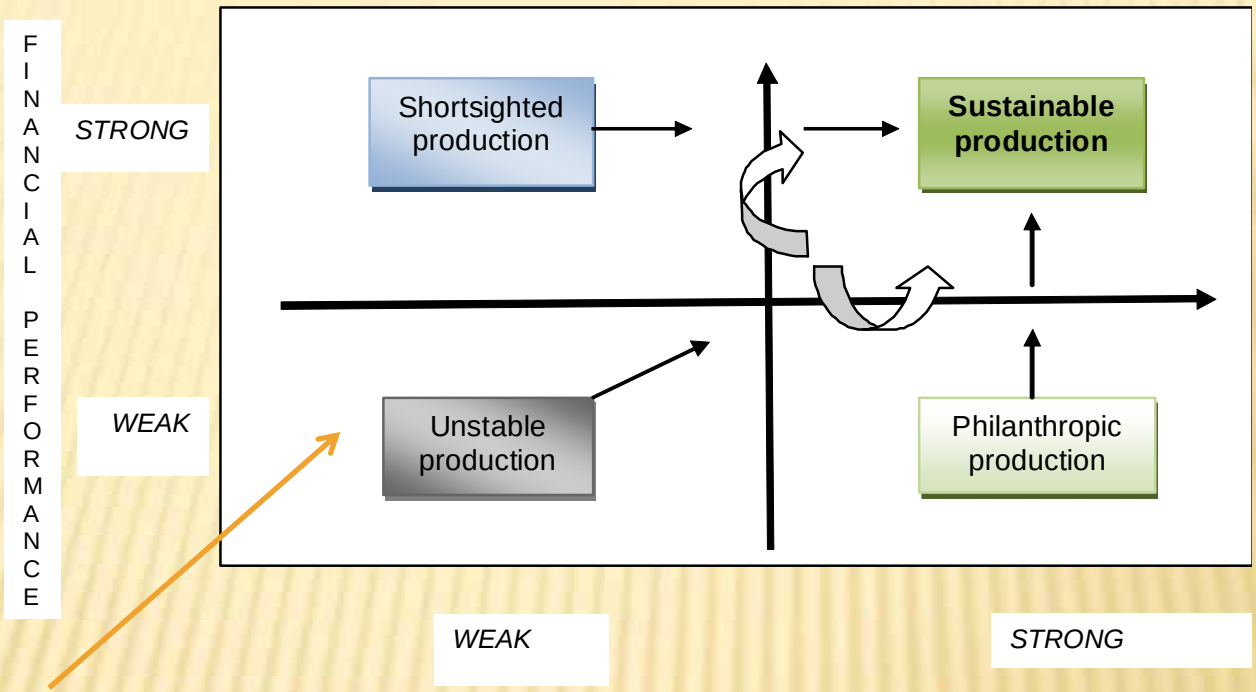
KEY CHARACTERISTICS OF SMES

Ian Vickers (project leader) and Prashant Vaze with Leah Corr, Eva Kasparova, Fergus Lyon
Centre for Enterprise and Economic Development Research, Middlesex University Business School

From a policy point of view, however, the sheer numbers, heterogeneity and 'low visibility' of smaller enterprises pose a particular challenge, and they **cannot be treated as scaled down versions of large businesses**. Characteristics which influence the responses of smaller enterprises to challenges and opportunities:

- ✖Limited resources, including with respect to access to finance and managerial knowledge and skills;
- ✖Organisational cultures which are dominated by the owner-manager;
- ✖A preference for less formal approaches to the management of the business;
- ✖Limited ability to influence and shape their operating environment compared to larger enterprises;
- ✖Low levels of awareness of and a reluctance to access the advice and support that is available.

Figure 2.3: Typology of firm strategic responses to market and environmental/political pressures



SMEs are usually here

Source: adapted from Søgard & Madsen (2007)

Centre for Enterprise and Economic Development Research
Middlesex University Business School
The Burroughs, London NW4 4BT
Tel: + 44 (0)20 8411 6604/5514
Email: i.vickers@mdx.ac.uk

Research Team
Ian Vickers (project leader) and Prashant Vaze
with
Leah Corr, Eva Kasparova, Fergus Lyon

BUREAU OF ENERGY EFFICIENCY, INDIA
SME PROGRAM

- Energy Efficiency in the MSME sector assumes importance because of the prevailing high costs of energy and supply related concerns.

- In general this sector lacks in accessing technology due to poor consultancy support/services for technological information, non availability of skilled man power, lack of awareness among entrepreneurs, emphasis on production and production cost, lack of managerial skills and poor adoptability to changing trade &trends.

- Energy conservation addresses competitiveness, energy security, environment and supply related issues in one go.

BUREAU OF ENERGY EFFICIENCY (BEE), INDIA AND UNIDO JOINTLY ORGANIZED – "NATIONAL CONFERENCE ON FINANCING MECHANISM FOR ENERGY EFFICIENCY IMPROVEMENT IN SMES"

Introduction of energy efficient and renewable energy technologies in MSMEs faces many hurdles

1. Access to technology
2. Risk aversion (disruption of production process)
3. Lack of understanding of energy economics
4. Banks are reluctant to lend money to very small companies as significant transaction cost will occur

SARDER, J., 2001, BASED ON A SMALL SAMPLE OF 19 ENTREPRENEURS IDENTIFIED THE FOLLOWING (AS PERCEIVED BY THE RESPONDENTS) AS THE MAJOR DIFFICULTIES

- lack of modern technology
- lack of adequate investments
- irregular/inadequate supply of power
- high rate of interest on bank loans
- inadequate availability of raw materials
- absence of clear-cut government policies
- fierce competition
- lack of skilled technicians and workers
- lack of research and development facilities.

SME IN DEVELOPING COUNTRIES

- Owner tightly controls all aspects of business, especially financial dealings
- Reluctance to absorb new ideas
- Little regard for environmental compliance
- In most cases is not registered, and extremely shy to expose operation to outsiders
- Propensity to evade taxes and VAT; usually do not pay full utility bills
- Usually manufactures low quality shoddy products; appeal to customers is low price of products
- So long as reasonable profit is ensured, no interest to improve operation (energy or material resource efficiency)

WHY IT IS DIFFICULT TO ATTAIN RESOURCE EFFICIENCY IN SMES

- Owners are not sufficiently literate to understand resource efficiency, and to deal with banks to seek loans for implementing new ideas
- Owners are not convinced about the benefits of resource efficiency, which is often based on life-cycle analysis; **payout period is the preferred criteria**
- Usually too small for bank lending, and also there are problems with creditworthiness and collateral
- Cannot devote skilled manpower to develop and practice an EMS

OPPORTUNITIES IN RESOURCE EFFICIENCY

- Scope to save energy in lighting, fans, motors
- Scope to save energy and material through machinery upgradation and improvements in operation
- Where applicable significant scope of reducing water use (low water devices; recycling; process changes and optimization)
- Large scope of reducing the use of chemicals and processing aids

Case Study 1: Bengal Pacific (Pvt.) Ltd.

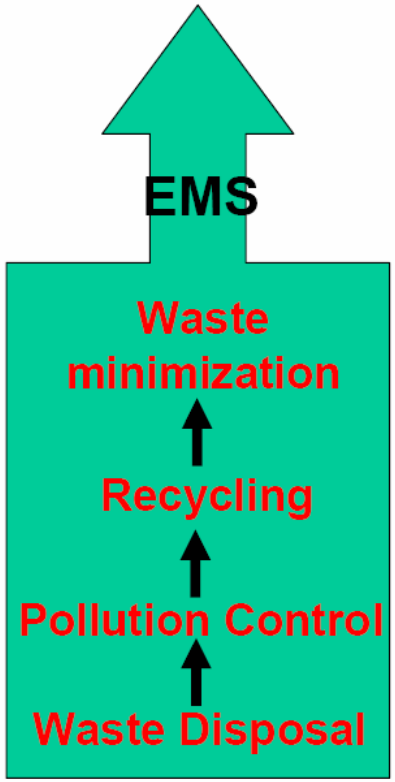
Location: Painadi
Sidhirganj
Narayanganj

100% Export Oriented Factory

Reduction of Utilities by Installation of EMS

May 2006 (Without EMS)

Indicators	Tk / kg production
Power ↓	3.93
Chemical ↓	17.50
Wastage ↓	26.59
Water ↓	0.029
GHGs ↓	0.543 (kg/kg production)



Present 2007 (With EMS)

Tk / kg production	Reduction
3.75	4.58 (%)
14.00	20.00 (%)
23.24	12.60 (%)
0.026	10.34 (%)
0.383(kg/kg production)	29.46 (%)

Case Study 2: Bengal Plastic Industries Ltd., Unit-04

Location:

Domna, Kashimpur,
Zirani bazar, Gazipur

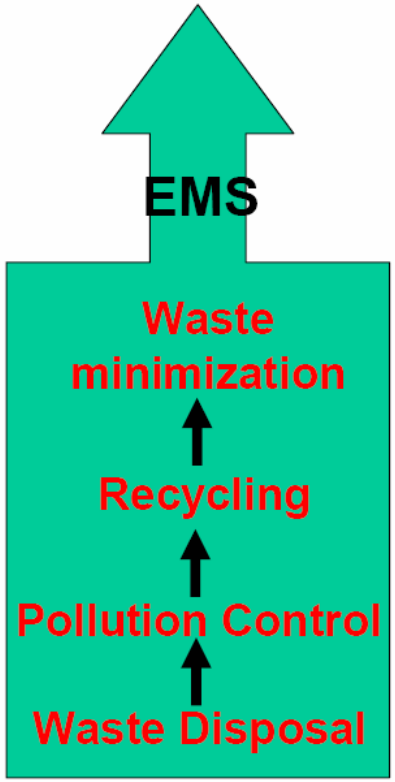
Plastic Furniture is the

Main Product

Reduction of Utilities by Installation of EMS

(Without EMS)

Indicators	Tk / kg production
Power ↓	3.20
Chemical ↓	5.37
Wastage ↓	3.79
Water ↓	0.0024
GHGs ↓	1.41 (kg/kg production)



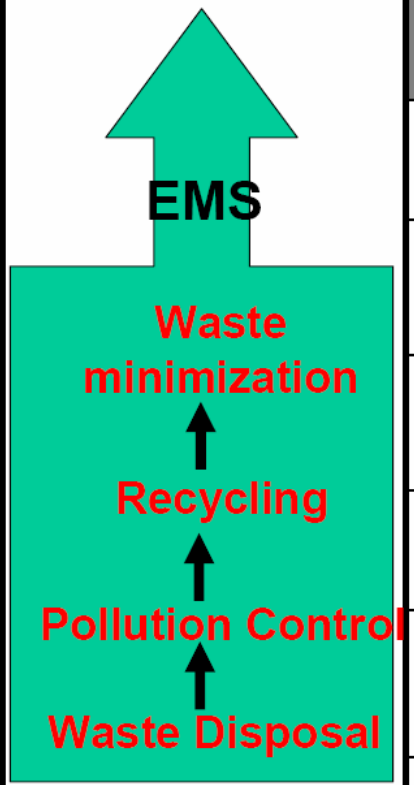
Present 2007 (With EMS)

Tk / kg production	Reduction
2.86	10.84 (%)
5.32	1.01 (%)
2.64	30.54 (%)
0.0022	5.23 (%)
1.39 (kg/kg production)	1.7 (%)

Reduction of Utilities by Installation of EMS APPL

(Without EMS)

Indicators	Tk / kg production
Power ↓	3.34
Chemical ↓	7.10
Wastage ↓	14.72
Water ↓	0.027
Cost of Incineration ↓	0.022
GHGs ↓	2.20 (kg/kg production)



Present 2007 (With EMS)

Tk / kg production	Reduction
3.31	1.01 (%)
6.47	8.87 (%)
12.63	14.19 (%)
0.019	29.62 (%)
0.020	9.09 (%)
2.14 (kg/kg production)	2.72 (%)

Indicator	Bengal Pacific (Pvt.) Ltd.	Bengal Plastic Industries Ltd.	Arbab Poly Pack Ltd.
Savings / annum	30,96,441	17,98,330	30,67,375
Water consumption reduction	10.34 (%)	5.23 (%)	29.62 (%)
Power consumption reduction	4.58 (%)	10.84 (%)	1.01 (%)
Wastage minimization	12.61 (%)	30.54 (%)	14.19 (%)
Chemical wastage reduction	20.00 (%)	1.01 (%)	8.87 (%)
GHGs reduction	29.46 (%)	1.70 (%)	2.72 (%)
Load of water treatment plant reduction	Significant	Significant	Significant
Load of incinerator reduction	N/A	N/A	9.09 (%)
Risk minimization	Significant	Significant	Significant

LARGEST SME IN BANGLADESH

Brick Making

More than 5000 kilns

Highly polluting

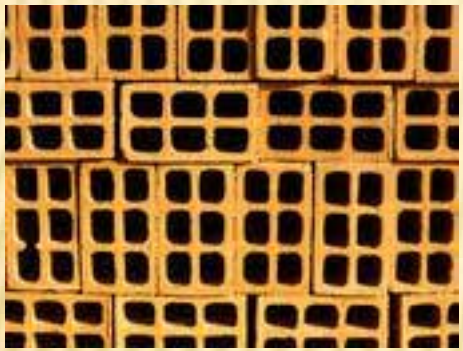
Uses huge amount of clay from agricultural soils

Very inefficient use of high-sulfur coal

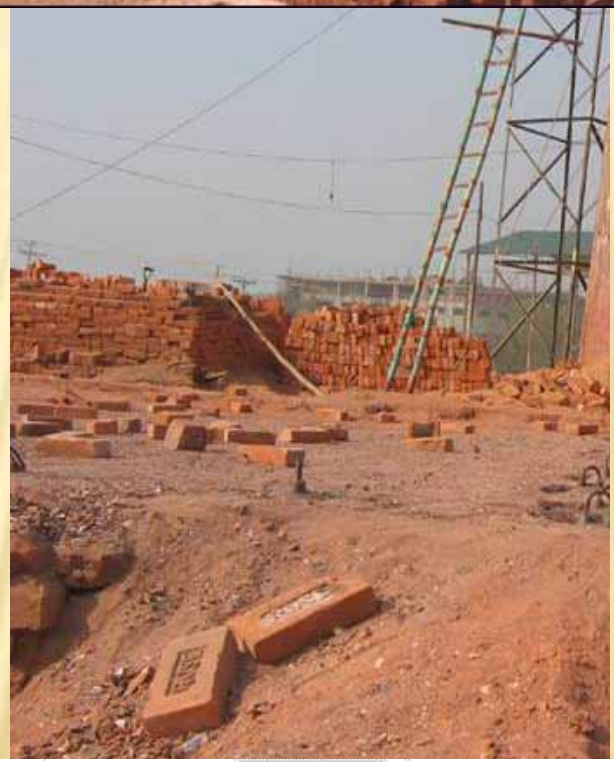
Owners very reluctant to change age old practice

Only responds to extreme regulatory pressures

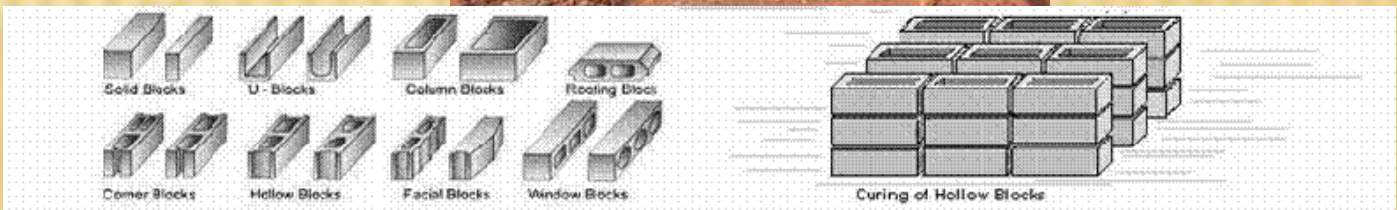
FIRED SOLID BRICKS AND THEIR ALTERNATIVES



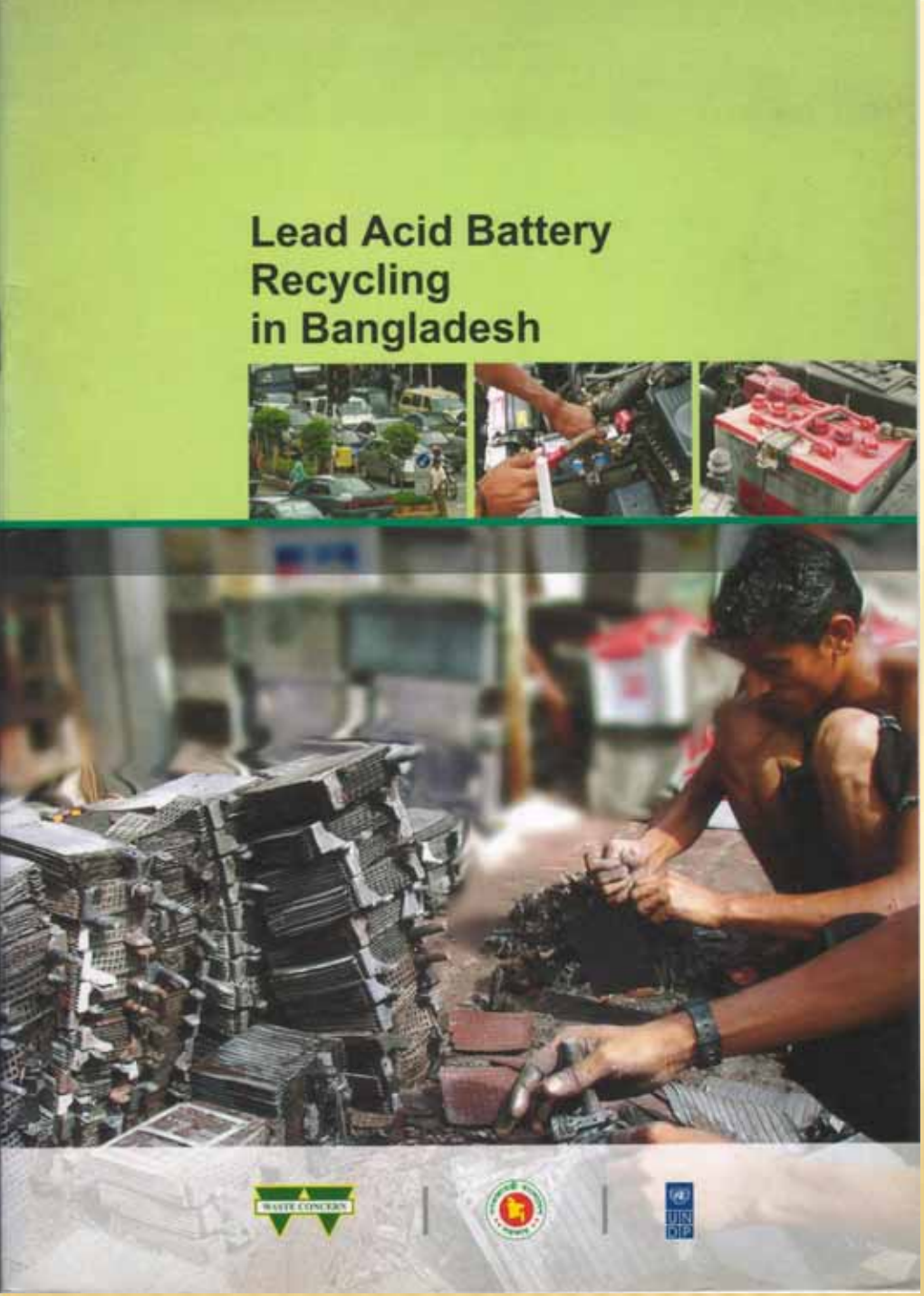
Hollow bricks - less clay, less coal



Hollow bricks



Cement Blocks



Micro enterprise

Employs 8-12 persons

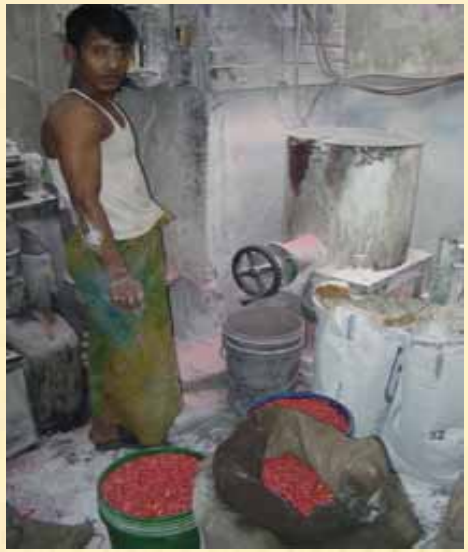
Operation involves serious health hazard for workers

Significant pollution of the surrounding area

Able to recover only 65% of the lead compared to over 95% in modern process

Quality of recovered lead low

Plastic waste being shredded for recycling


Manufacturers (Pellet Producers)

SMEs in operation



Manufacturers (Commodity Producers)

Manufacturers

Alternative Production and Cost Savings in Winch Dyeing

Samiya Ahmed
Alexandra Clemett
Matthew Clark
Kelvin Tapley

SEI STOCKHOLM ENVIRONMENT INSTITUTE

BCAS

UNIVERSITY OF LEEDS

DFID Department for International Development

Cost Savings from Alternative Production

1.1 Improved Fixation

Fixation levels for reactive dyes, when doing deep dyeings, can be as high as 70%. Tests in several factories in Bangladesh, have shown that currently fixation ranges from 40-65%, some 5-30% below the possible maximum.

1.2 Right First Time

Further savings can be made by ensuring that the recipe is carefully developed to suit the dye type being used (see Chapter 2) and that the recipe is accurately followed on the factory floor. Research in factories in Bangladesh suggests that errors due to incorrect recipes or not following the recipe could result in around 20% of fabric being re-shaded and around 10% being re-bleached and re-dyed. If this is the case then it is possible to make yet more savings by improving the number of "right first time" dyeings.

Housekeeping

4.1 Storage
4.2 Handling of Chemicals
4.3 Liquor Ratio
4.4 pH Control
4.5 Temperature Control

Summary

Improving efficiency and saving money in textile dyeing need not be expensive. Simple changes to procedures and housekeeping can save considerable amounts of money. Taking the time to observe process inefficiencies, calculate financial losses from these inefficiencies and make plans to correct them can do a lot to improve the competitiveness of a factory. It will also reduce pollution.

Leather Tanning

- Significant industrial activity in most developing countries; some countries also import raw hides
- Highly polluting (solid, liquid, gaseous)
- Produces huge quantities of organic wastes (BOD), which can be used in a biogas digester to produce energy

Children crossing dangerous wastewa

- Produces wastes containing chromium, which can be recovered both from **chrome shaving** and tanning wastewater
- Produces significant H_2S pollution in the 1-2 km radius

Children playing with chrome shavings

Pictures – Courtesy: Photographer Bulbul Ahmed


Thank You