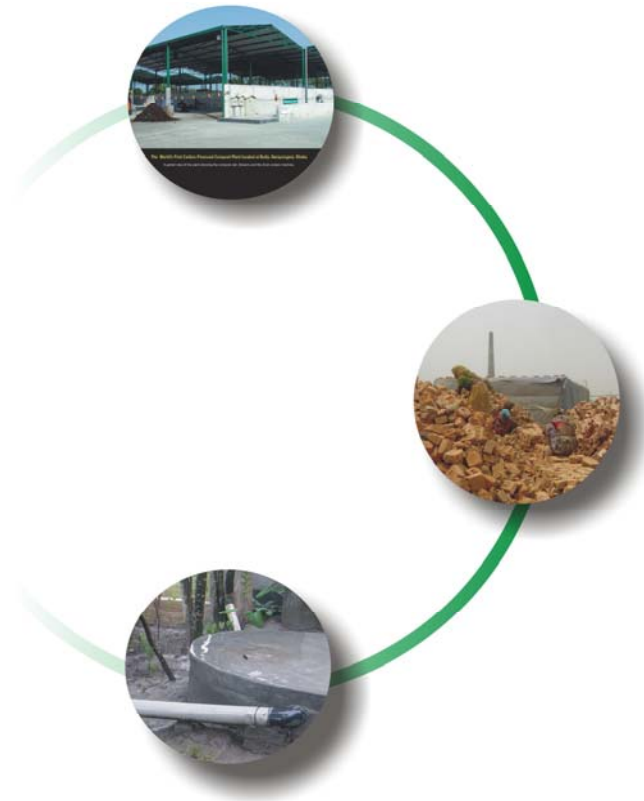


# ASSESSMENT OF GREEN JOBS in CONSTRUCTION SECTOR



By  
**Waste Concern Consultants**  
House 21 (side B), Road 7, Block G, Banani Model Town, Dhaka 1213, Bangladesh  
[www.wasteconcern.org](http://www.wasteconcern.org)



**DRAFT**

---

September, 2010

## **Assessment of Green Jobs in Construction Sector**

---

**Prepared by:  
Waste Concern Consultants**

Address: House 21 (side B), Road 7, Block G, Banani Model Town, Dhaka 1213, Bangladesh. Tel: (88-02) 9873002,  
9873067, 9873110,

Fax: 9884774 Email: [office@wasteconcern.org](mailto:office@wasteconcern.org) Web: [www.wasteconcern.org](http://www.wasteconcern.org)

## Executive Summary

The construction sector has been growing fast in Bangladesh. In terms of employment, it has been growing at 7.3 percent during 1991-2006 periods. The growth rate in terms of GDP has been 6.7 percent during 1995-96 to 2008-2009. Most of the construction sites, particularly of the real estate or housing sector, are however located in three divisional headquarters of Dhaka (also the capital city), Chittagong and Khulna. In regulating the construction sector five agencies have central role. These are RAJUK (Capital Development Authority) for Dhaka, Chittagong Development Authority (CDA) for Chittagong and Khulna Development Authority (KDA) for Khulna. The Public Works Department (PWD) and Housing & Settlements Directorate (HSD) are the national level government agencies responsible for regulating the construction activities in the country.

In 2008-2009, total construction sector employment stood at 2.024 million. Even at the current growth rate, the total employment in the construction sector will increase to 2.88 million by 2014 and 3.32 million by 2020. It is to be noted that construction activities are dominated by informal employment. Since all informal sector activities and workers engaged in the construction sector are not counted, it is possible that the actual size of the informal sector will be higher than the official employment figure cited here.

On the basis of survey result suggesting that 66 percent companies consider incorporation of green building technology/construction materials, it is estimated that in 2009 1.34 million workers engaged (66% of total employment) in the construction sector that adopt or at least consider green job requirements in terms of choice of technology and construction materials.

On the basis of 7.36 percent annual growth rate of employment in the construction sector, it is also projected that the employment with green job using construction practices will increase to 1.91 million and 2.19 million respectively in 2014 and 2020. Since this projection is based on an assumption that currently 66 percent construction companies adopt or at least consider using green technology, it may be an overestimate if the practices are not real. However the estimate may be an underestimate if more green practices are adopted with growing concern on emissions. Public policy for promoting green jobs in the days ahead also will make a big difference.

However it needs to be noted that the occupational health and safety (OHS) rules and labour income standard criteria-wise, many of the construction sector jobs cannot be considered green jobs. The modest Bangladesh Labour Act 2006 (XLII of 2006, in Chapter V- Health and Hygiene) requirements are not adequately met.

### Green Jobs Creation Barriers in the Construction Sector

From field observation, questionnaire survey and focus group discussions, it became clear that the construction sector's potential to create green jobs are impeded by a large number of barriers. These are grouped into policy, institutional, technical, and financial and information barriers. While section 4.3 contains the details, major barriers are noted below:

#### Absence of Necessary Public Policy

- Lack of specific policy for modernizing the construction sector, particularly for meeting the requirements of green jobs.

- Lack of regulations and fiscal incentive to encourage more energy-efficient practices and technologies.
- Lack of government involvement or action to assist the brick industry to undertake comprehensive programs to transform it to a less polluting, yet profitable industry.
- Lack of government action to enforce OHS requirements for improving the condition of poor construction works, particularly of women.

#### Technical and Capability Gap

- Lack of capability and expertise for using green construction materials.
- Knowledge gaps in adoption of green construction technology among the stakeholders.
- Lack of capacity in terms of technical and business skills at the enterprise level to manage the necessary changes that could result in more efficient production and less pollution.
- Skepticism about durability of green materials used buildings.
- Lack of technical knowledge for using the hollow concrete bricks instead of traditional blocks.
- Lack of information on green construction technology.
- Lack of awareness on the quality standard required for steel.
- Lack of awareness of construction materials at the end user level.

#### Financial Constraint

- High capital cost to import low carbon emission technologies for the construction sector GHG.
- Inadequate investment to finance research and development (R&D) for improving local practices and innovations in the construction sector.
- Lack of access to liquidity to financial source to modernize the traditional brick-making technologies as well as to expand the new innovations such as hollow concrete bricks.

#### Limited Awareness on Occupational Hazard

- Lack of awareness on environment-degrading and human health effecting construction materials.
- Lack of awareness-raising programs for labourers, particularly in cement production.
- Lack of awareness on the part of workers about inadequate OHS facilities in the work sites. Workers' inability to organize, particularly by the women, for improving OHS facilities and gender equality.

### **Public Policy and Actions Necessary for Overcoming the Barriers**

Green job and production projections for the construction sector, presented in Section 4.2, are based on the present practices of using green raw materials and technology. Despite numerous barriers (Section 4.3), these projections show that (a) green job will increase from 1.33 million in 2009 to 2.19 million in 2020 and (b) green GDP from the construction sector will rise from Tk. 1,97,585 million in 2009 to Tk. 3,29,967 million in 2020. However if the identified barriers can be overcome or reduced, the potential of green jobs and green production in the construction sector should increase by several folds. Although as a developing country Bangladesh will not be able to tackle all barriers to adoption of GHG reduction practices or improve the OHS facilities radically or quickly, public policy and action programs targeting the following specific areas will significantly contribute to expansion of green jobs in the industry.

## For GHG Reduction

For GHG emissions from the construction sector, public policy need to specifically target following areas for urgent actions:

**Bricks:** Switching from traditional bricks to hollow concrete block. Although this has already begun in a small-scale, use of incentive measures will increase adoption of more hollow concrete blocks. Raising awareness at the end-user level including the labourers is another area for urgent action in this regard.

**Green Construction Materials:** Increasing the supply of known green construction materials by both domestic productions as well as by importing if necessary.

**Private Generators:** Substituting public utilities and public goods by private system militates against economic logic. But this is happening in today's Bangladesh as seen in widespread reliance on private generators as a substitute of electricity supply. This practice needs to be discouraged by increasing tax and giving incentives for increasing the green energy supply.

**Building Design:** Incentive measures for energy-efficient building, building layout, design, planning and construction that meet the criteria of energy-efficient building. Durability of buildings and their location as per land-use planning need to be promoted for reducing widespread demolitions rebuilding, reconstructing, etc.

**Ship-breaking:** Since ship-breaking industry is a backbone of iron/steel required for the construction industry, public policy need to focus on greening this vital component of the construction industry. Public policy should require the manufacturers to remove the impurities in the iron/steel of the scrap ships before using as raw material for iron rod production. Such steps will ensure 40-60 grade rod quality.

**Green Lending:** Lending policy of financial institutions needs to be modified for funding adoption of green construction materials use and utilization technology. This should be a good leverage to influence green construction materials & technology choice.

## OHS Measures for Improving the Workplace and Rights at Work

The labour dimension of green jobs is relatively more remediable. Taking measures in this direction should not be costly. Just because Bangladesh is a labour-abundant economy and thousands of workers are willing to work at any wage rate or level and not aware of the hazards associated with their work, it is not acceptable that the present working condition should be allowed to continue. Field observations, interviews and focus group discussions – all point to the urgent areas of actions to improve OHS facilities. Specific recommendations for actions are as follows:

**Wage Rates:** Wage rates in the construction sector need to be increased significantly. The industry and the employers should not worry about cost increase. A basic-need meeting benefit packages is the best guarantee for increasing productivity and also to promote green construction practices. Discarding the static view of cost increase from wage rise, the employers should realize that the dynamic benefits from healthy work environment and workforce can be manifold by virtue of greater motivation resulting in higher productivity.

**Woman and Child Labour:** Issues concerning the women and children are particularly crucial in the construction sector because hard labour is required in most construction works. Construction work sites expose the women to health hazards as well as abuses. Wage discrimination against women and child labour are also widespread. Although sanitation in general and toilet facility in particular is not adequate for any worker, women's special need is not met in most construction sites. Urgent action is necessary for separate toilet facility for women construction workers and provisions available for improved sanitation and health care services. Sanitary and sanitation services for women workers need to be provisioned.

**Use of Personal Protective Equipment (PPE):** Both hardware and software approaches are essential for improving the working condition and productivity of the workers. For example, some OHS facilities are of physical infrastructure nature (e.g., for providing water & sanitation and health services), whereas, campaigns to make workers, particularly women, aware of their rights at workplace and about hazards associated with the materials and technology of their work.

**Decent Work:** Education and training programs on 'decent work' and green jobs should be organized for employers, employees, workers, particularly for women.

## **Intervention Points for Immediate Actions**

Barriers to greening the construction sector - both for GHG reduction and improving OHS - are many. Corresponding public policy measures also are many. We therefore recommend priority in intervention points on the assumption that these interventions will set in motion forces that will ease many barriers identified by this study.

**Working with REHAB:** In the area of Occupational Health and Safety (OHS), the government and ILO should work, through the Real Estate & Housing Association of Bangladesh (REHAB), for requiring employers to provide Personal Protective Equipment (PPE) to each construction worker and ensuring their use. ILO can work with REHAB and Government agencies, particularly with the Ministry of Housing and Public Works (MOHPW) for this purpose. Establishing a PPE Focal Point in the ministry for monitoring supply and use of PPE should be considered.

**Certification of Green Materials:** The other priority area of action is to promote use for green materials in the construction sector. For example, tax incentives can ensure supply and use of reinforced hollow block for replacing the traditional mud bricks. The Housing and Building Research Institute (HBRI) can be trusted for certification of green materials, particularly the candidates for receiving government incentives.

**Preparation of Green Material Inventory:** Making available and accessible a green construction material inventory comprising both domestically available (e.g., reinforced hollow block instead of traditional mud block, plywood or wet process hardboard and particleboard instead of solid wood, and uPVC plastic pipe instead of the traditional iron pipe) and importable will generate sufficient interest to green the construction industry and to build energy efficient building.

**Incorporation of Green Material Use Promotion through BNBC:** Bangladesh National Building Code (BNBC) can be an important vehicle to promote green material use in the construction sector. BNBC need to be revised to reflect and incorporate the use of green construction materials.

-----

## ABBREVIATIONS

BBS	Bangladesh Bureau of Statistics
BNBC	Bangladesh National Building Code
BSRM	Bangladesh Still Rerolling Mills
BTK	Bull's Trench Kiln
CDA	Chittagong Development Authority
CNG	Compressed Natural Gas
ECA	Environmental Conservation Act
ECR	Environmental Conservation Rules
EIA	Environmental Impact Assessment
FCK	Fixed Chimney Kiln
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GHG	Green House Gas
GoB	Government of Bangladesh
HBRI	Housing and Building Research Institute
HSD	Housing and Settlements Directorate
ILO	International Labor Organization
ITUC	International Trade Union Confederation
KDA	Khulna Development Authority
LGED	Local Government and Engineering Department
LFS	Labor Force Survey
MOHPW	Ministry of Housing and Public Works
NHA	National Housing Authority
OHS	Occupational Health and Safety
PPE	Personal Protective Equipment
PHP	Hyper Text Pre Processor
PVC	Polyvinyl Chloride
PWD	Public Work Department
REHAB	Real Estate & Housing Association of Bangladesh
RAJUK	Rajdhani Unnayan Kartripakkha
ROAP	Regional Office for Asia and the Pacific
UNEP	United Nations Environment Program
VSBK	Vertical Shaft Brick Kiln
WCC	Waste Concern Consultants
WASA	Water Supply and Sewerage Authority

## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b>		<b>ii</b>
<b>ABBREVIATIONS</b>		<b>vi</b>
<b>TABLE OF CONTENTS</b>		<b>vii</b>
<b>LIST OF FIGURES</b>		<b>viii</b>
<b>LIST OF TABLES</b>		<b>ix</b>
<b>LIST OF PLATES</b>		<b>ix</b>
<b>LIST OF MAPS</b>		<b>ix</b>
<b>CHAPTER 1</b>	<b>INTRODUCTION</b>	<b>01</b>
1.1	Background	01
1.2	Objectives of the study	02
1.3	Methodology	02
<b>CHAPTER 2</b>	<b>CONSTRUCTION SECTOR PROFILE</b>	<b>05</b>
2.1	Employment size and growth	06
2.2	Policy and Legislation	07
<b>CHAPTER 3</b>	<b>GREEN JOB PRACTICES IN THE CONSTRUCTION SECTOR</b>	<b>09</b>
3.1	Role of professionals and institutions	09
3.2	Adoption of green job practices by the developers	10
3.3	Barriers for non use of green construction materials	12
3.4	Raw material manufacturing status	13
3.4.1	Cement manufacturing	13
3.4.2	Brick manufacturing	15
3.4.3	Wood & wood materials manufacturing	17
3.4.4	Plastic pipes manufacturing	19
3.4.5	Other raw materials manufacturing	22
3.4.6	Labor condition of raw material producing factories	23
3.5	Findings from field level questionnaire survey	24
3.5.1	Building construction sites (Residential, Commercial & Industrial) status	27
3.5.2	Socio-economic conditions of labourers in construction sites	32
3.6	End users' satisfaction level	34
3.7	Focus group discussions and findings	34
<b>CHAPTER 4</b>	<b>PROJECTION OF GREEN JOB GROWTH</b>	<b>41</b>
4.1	Green Job in the construction sector	41
4.2	Projection of green GDP from the construction sector	43
4.3	Green jobs creations barriers in the construction sector	45
4.4	Public policy and actions necessary for overcoming the barriers	46
	<b>REFERENCES</b>	<b>49</b>
	<b>ANNEX</b>	



## LIST OF FIGURES

Figures	Title	Page
Fig 2.1	Sectoral composition of employed labor force, 2005-2006	06
Fig 2.2	The growth rate of employed labour force in the construction sector, 1990-91 to 2005-06	07
Fig 3.1	Use of energy efficient materials in construction sites	10
Fig 3.2	Annual turnover of companies	11
Fig 3.3	Monthly generation of wastes and their reuse in wood factories	18
Fig 3.4	Noise level in wood factories	18
Fig 3.5	Light level in wood factories	18
Fig 3.6	Type of products produced in plastic pipe factories	19
Fig 3.7	Noise level in plastic pipe factories	21
Fig 3.8	Light level in plastic pipe factories	21
Fig 3.9	Temperature level in plastic pipe factories	21
Fig 3.10	Use of PPE by labourers	22
Fig 3.11	Construction labourers' exposure to health hazards	23
Fig 3.12	Type of buildings by land area	27
Fig 3.13	Storage area of hazardous materials in different <i>residential</i> construction areas	29
Fig 3.14	Storage area of hazardous materials in different <i>commercial</i> construction areas	29
Fig 3.15	Storage area of hazardous materials in different <i>industrial</i> construction areas	30
Fig 3.16	Water consumption of construction sites	30
Fig 3.17	Percentage distribution of construction sites by their power consumption	31
Fig 3.18	Percentage distribution of factories by male and female labourers in the workforce	32
Fig 3.19	Salary ranges of workers by different construction sites	32
Fig 3.20	Work site hazards of labourers in the construction sites	33
Fig 3.21	Availability of toilet facilities for workers in working areas	33
Fig 4.1	Projection of green job potential in construction sector	42
Fig 4.2	Projection of construction sector's contribution to GDP and GDP with green job	45

## LIST OF TABLES

Tables	Title	Page
Table 2.1	Present status of the construction sector relative to other sectors	05
Table 2.2	Construction sectors share, in total employed labour force, 1990-91 to 2005-06	07
Table 3.1	Priority ranking of construction materials and electrical accessories	11
Table 3.2	Amount of raw materials with origin and consumption in tonnes per day	14
Table 3.3	Monthly production of plastic pipes	20
Table 3.4	Type of waste materials with amount, disposal area, reuse and sales	28
Table 3.5	Hazardous materials with storage duration and disposal area	28
Table 3.6	Growth rate projected employment in the construction sector	41
Table 3.7	Projection of employment in the construction sector from 2006 to 2014 and 2020	41
Table 3.8	GDP growth rate calculation of construction sector from 1996-2009	44
Table 3.9	Optimistic scenario of green GDP projection from 2009 to 2020	44

## LIST OF PLATES

Plates	Title	Page
Plate 3.1	Fixed chimney kiln in brick manufacturing area, Savar	16
Plate 3.2	Covered kacha bricks in brick manufacturing area, Savar	16
Plate 3.3	Presentation on focus group discussion by Mr. A.H.Md. Maqsood Sinha	35
Plate 3.4	Mr. Kamran T.Rahman is seen speaking	37
Plate 3.5	Mr. Iftekhar Enayetullah responds to a query	38

## LIST OF MAPS

Maps	Title	Page
Map 3.1	Map showing questionnaire survey location of building construction in <i>DMP</i> area	25
Map 3.2	Map showing questionnaire survey location of building construction in <i>Gazipur</i> district	26