

# Protecting the Circumstances by Green Financing: Possibility of Energy Saving Automated Brickfields in Bangladesh

Md. Julker Naim<sup>1</sup>  
Dr. Md. Ezazul Islam  
Taslim Ahammad

## Abstract

*The main objectives of the s paper are to present the pollution of circumstances and ways to reduce by green financing. Energy saving automated brickfield making industry is the key concern of this research. Energy saving automated brick technology with the promises to protect the environment against the multidimensional damage done by old brick system. Now-a-days Bangladesh faces a flourish in real estate sector that stimulates the brick industry too, but the very old traditional brick making system destroys the diminishing forest of this country intensifying the emission of carbon in the air polluting environment and end the life and livestock of the country. After presenting such facts regarding old brick system, the paper also examines the potentiality of energy saving automated brick technology with details as well as protecting the circumstances by green financing. Automated process, government support and extreme high demand with income through selling carbon credit are some promises of this energy saving automated brickfield.*

**Keywords:** Energy Saving Automated Brickfield Technology, Old Brick Making Industry, Securing Environment, Green Financing, Bangladesh.

## 1. Introduction

Bangladesh can lessen significant amount of carbon emission and conserve its forests and environment through adopting energy efficient clean technology in brick kilns. However, there is hardly any research work on securing environment with special focus on energy saving automated brickfield role in Bangladesh. According to the Air Quality Management Project (AQMP), Bangladesh is rated as having one of the worst air quality in the world, causing an estimated 18,000 premature deaths a year in capital Dhaka alone. Brick kilns around Dhaka are the main reason of this worst air quality. The brick kilns emit toxic fumes containing carbon monoxides and oxides of sulphur (SO<sub>x</sub>) are harmful to eye, lungs and throat. These air pollutants inhibit the mental and physical growth of children as well as the old people and affect crops and plants in the areas nearby to brick fields.

This article aims to present the fact how this endangered environment of Bangladesh can be saved by the mass use of energy saving automated brick technology.

This article is divided into five parts: the 1<sup>st</sup> part contains the research methodology used in this work; in 2<sup>nd</sup> part a discussion on old brick making industry in Bangladesh is provided. In the 3<sup>rd</sup> part, a discussion will be presented on green finance for the energy saving automated brick technology. In the 4<sup>th</sup> part, the paper reviews the possibility of the energy saving automated brick technology in Bangladesh. The final part of the paper concludes with conclusion, research findings, and policy implications.

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The authors are Assistant Director and General Manager, respectively at Bangladesh Bank. Another author is an Assistant professor of BSMRSTU. The views expressed in the paper are authors own and do not reflect those of Bangladesh Bank. The authors can be reached [julker.naim@bb.org.bd](mailto:julker.naim@bb.org.bd) ; [ezazul.islam@bb.org.bd](mailto:ezazul.islam@bb.org.bd) and [taslim.ahammad.hr@gmail.com](mailto:taslim.ahammad.hr@gmail.com)

## **Background of the Study:**

Although only before 1739, the roots of environmental movement can be found, but most modern history does not reflect until our management is sustainable for sustainable management and sustainable management. Just how it seems to lead the situation in our progress environment; Industrial revolution, pollution, cars and smoke, insecticides can continue, and on. In the twentieth century, environmental concerns grew in popularity and recognition, and in the 1950s, 'perfect growth' was responsible for public awareness and encouragement to go '60, 70' and 'green'. It is not safe to say that more people and businessmen recognize the importance of conserving our environment and accepting green practices, it can be said that the movement is not a trap, but mainstream and not safe here to stay here. Between 20 and 25 years ago, there was an alternative to creating environmentally friendly choices rather than the necessary and real life, rather than the "tree touches" type. Since then, we realized that if we really want to "save the planet", we should consider the effect which we have directed towards its destruction. Plates are not just for the people to change, so the business around the world is pretty close. In the last decade, people across the board were cut from waste and promoted world-friendly products and services. In a financial sector, a growing trend for the development of deer banking system is a step. Financial institutions recognize their role in a paperless society and work on implementing effective, convenient, less unexpected strategies every day. Online banking, electronic bill pay and e-statement only facilitates online banking information gathering and branch visit - gas. Nevertheless, the company now uses remote capture in the process of testing their business conditions. Remote capture is baking's future wave, and it's green-a major bonus.

## **Objectives**

The objective of this paper is to present a) to access out traditional brick system in Bangladesh & b) to access out possibility of environment saving automated brick technology by green financing.

## **Methodology**

The study based on both primary and secondary sources. The facts have been presented after the discussion with colleagues. The primary data were collected through informal conversation with employee working in energy saving automated brick technology. The cost of setting a energy saving automated brick technology kiln and justification of that cost had been the issue of

conversation. The secondary data were collected on perusal of the selected available research work, text book, articles, journals, newspaper analysis, related websites and analysis of reported case decisions.

### **Literature review**

**British Institute of Management (BIM) (1992)** urged in favor of greening and launched a major report which produced basic tips on greening the workplace.

**Rutherford Michael (1994)** stated that Banks need to monitor post transaction for the ideal environmental risk management program during the project implementation and operation.

**Schmidhciny S, Federico J, L Zorraquin (1996)** described that commercial banking has been emphasized on investment banking rather environmental risks but it would play a larger role in their investment decision in the near future.

**Jeucken M and Bouma JJ (1999)** mentioned that investment which take into account of environmental side-effects usually have lower rate of return.

**PravakarSahoo, Bibhu Prasad Nayak (2008)** explored the importance of green banking and highlighted important lessons for sustainable banking and development in India.

**Ginvosky, John (2009)** focused on the efforts of community banks in the U.S. to leverage sustainability, or green banking.

**Rahman A (2010)**, governor of the central bank of Bangladesh, focused on green banking.

**Ullah, M. M. (2010)** marked green banking as a component of global initiatives to save the environment and climate. He concluded the study pointing out that state owned commercial banks and social development banks are less concerned with this issue.

**Khan, M.T.A. (2012)** stated that green banking initiatives by all banks are a moral obligation to save the people. He also urged that lenders should consider 'Go green' and 'Think green' themes.

**Millat, K. M. et. al; (2012)** reported that Banks in Bangladesh have enthusiastically responded to Bangladesh Bank's guidance about green banking, with steps in environmentally responsible financing that are beginning to make profound impact on environmental practices in the real economy.

**M. Amiruzzaman, Julker Naim; BBT (2016)** Green Banking Practices in Bangladesh, An Ingenious Action for Sustainable Development. Climate change is the most complicated issue the world is facing. Across the globe there have been continuous endeavors to measure and mitigate the risk of climate change caused by human activity. Many countries the world over have made commitments necessary to mitigate climate change. Although banks are considered environment friendly and do not impact the environment greatly through their own 'internal' operations, the 'external' impact on the environment through their customers activities is substantial.

Studies generally pointed that banks in Western Europe countries obeyed to the rules and took initiatives to improve their sustainability (they put the three indicators of society, environment and economy almost at same value). The RARE organization study showed that the majority of European banks didn't measure performance related to indirect aspects (customers and financial products) (Vigano, 2006). The conclusion of EIRIS organization (2007) was that OECD-Europe region was most advanced on products and services beneficial to the environment. The results of the sustainable assessment of six UK banks by Amacanin (2005) indicated that majority of the banks had reached the preventive banking phase in Jeucken's model while only two banks had reached the higher phase of offensive banking. In Spain, it was shown that in the presence of a positive valuation of social responsibility practises by consumers, a firm may obtain a better strategic position, along with higher margin, demand, and profit, and the empirical analysis confirmed that consumers significantly value other features apart from price in making deposit and mortgage decisions, particularly a financial institution's social responsibility (Callado, 2006). Zappi (2007) presented the modular approach given to CSR and the need for integrating CSR into the fundamental strategic orientation of an Italian bank, in order to mainstream CSR into the heart of business theory and practice. In Portugal, a study suggested that legitimacy theory may be an explanation of social responsibility disclosure by banks (Branco, 2006). In Ireland, research has revealed discrepancies in corporate social reporting. The experience of the top five Romanian banks confirms the theoretical assumptions: the highest rated banks, considering their total assets, were also socially and environmentally responsible corporate banks (Cosmin, 2008). The results of the UNEP-FI survey (2006) among financial institutions and stakeholders in Greece have revealed many good approaches regarding

## **An synopsis of old brick making industry in Bangladesh**

Bangladesh is the 5 most densely populated country ranked 9th largest populous country with 160 million people. Each year 4,00,000 to 5,00,000 rural people migrate in Dhaka. The existing people as well as new migrants need housing facility. At present in our country the annually required shelter varies from 3 lakh to 5.5 lakh units. Bangladesh will need to construct approximately six million new houses annually to accommodate the growing population (Rahim, 2011, p. 2). Bangladesh has about 6,000 authorized brickfields and numerous illegal ones. (Bayron, 2009). Rapid urbanization in the country has created a booming construction industry and push the production of 8.6 billion bricks each year, with demand for the bricks rising at an annual rate of about 5.28 percent (UNDP; 2011). The illegal brickfields do not have proper license to keep the fields into track and proper resources to run. The brickfields are typically small independent units and operate 24 hours during the dry season. They are located near towns or major construction sites; i.e., Ashuliya, Gabtali, Narayongonj, Savar, Keraniganj, Narshingdi, Gazipur and Manikganj.

The largest brick making zone is on the north of Dhaka city, where more than 1,000 brickfields are situated (Khan, 2009). The existing technology for firing kiln are fixed chimney kiln (FCK) and bull's trench kiln (BTK); though last one is banned in Bangladesh contributes 16% of production. The main raw materials used in brick kilns to dry bricks are firewood and coal as well as some time use oil. But most of the time they use firewood. As a result a large number of trees like Keora, chaila, sundari, mehguni, bain etc. are being felled madly. Furthermore, using of firewood in kilns also results in significant deforestation and this wood still account for about 25 percent of the fuel used in Bangladesh's brick making kilns every year. The department of environment said that the 4,000 brick kilns burn nearly 20 lakh tons of coal and another 20 lakh tons of wood every year to meet the demand for 400 to 1200 tons of fuel (Roy, 2004). Another investigation reveals that workers of the brick field not only cut many trees but also built dikes to stop water from entering its premises during high tide which results in sudden flood in the adjacent areas. Inquiry suggested that many brick manufacturers set up their kilns near forests with the intention to plain the forests illegally. Beside this, people working in the brickfield because of deadly air and poor water quality have to accept a subhuman life. On an average every workers receive 80 taka every day for over 12 hours of extremely hard or hazardous work (Akter, 2010).

In Bangladesh there are three major sources of air pollution, they are-

- (a) Vehicular emission,
- (b) re-suspended road dust
- (c) Small industries like brick kilns and other biomass inclinator

(Ferdausi, Vaideeswaran & Akbar, 2008).

Most brick fields have set up 25-foot tin chimneys in place of 120-foot ones, defying government rules. In the brick kilns smokes are wafting out of the chimneys polluting the environment of the area. According to the Brick Kiln Control (amended) Act (2001), there must be no establishment of brick furnace within a three-kilometer radius of human inhabitation as well as fruit garden. But lack of proper monitoring of our government, brickfields have sprung up like mushrooms and the situation has created a serious threat to environment and biodiversity while the people in the neighboring areas face health hazards and fertility of farms is going down (The Daily Star, 2011).

### **Compensation from The Bangladesh Bank and Private Banks to encourage energy saving automated brickfield by Green Financing:**

Bangladesh is identified by climate change expert as being among the countries more severely challenged by climate change threat. The government and Bangladesh Bank have remained fully aware and proactive in this respect, using countries own meager resources besides whatever modest support is being provided by the international community.

Bangladesh Bank has proactively come forward to complete the above funds by putting in place a fund of Taka 2.0 billion to refinance lending renewable energy generation and other environmentally beneficial project like energy saving automated brickfield. Taka 838.4 million has already been disbursed from this Bangladesh Bank fund, of which 56.3% was for solar energy, 30.8% for biogas, 9.1% for energy saving brickfield and 4.8% for effluent treatment plants.

### **Cost and productivity of energy saving automated brick technology**

Energy saving automated brick technology has already started working in different areas of our country; i.e., Savar, Dhaka, Ashulia, Mymensingh, Khulna and Norshindi, Narayongonj. Production of such bricks suggested that they need only 40% of human intervention than that of the traditional one and as the production continues throughout the year it keeps all people active without any streamlining. In its preparation, coal and clay are mixed automatically and then

poured into a machine. In every piece of brick about 2-3 percent coal is mixed. Bricks are prepared automatically and taken to a silo, and smoke of the kiln for drying the raw bricks (Byron, 2009).

It is the production process used in Diamond Auto Green Brick, Saughat, Narayanganj. Another green brick kiln in Dhamrai use approximately seven to 7.5 tons of coal per 100,000 bricks (Wasserman, 2009). The technology of installing Energy saving automated brick technology is expensive than the traditional one. It will take Tk 5 crore to Tk 10 crore to set up an energy efficient brick kiln that will be able to produce around two crore bricks annually - some 40,000-50,000 bricks per day; whereas Tk 1 crore is required for a old brickfield. The strength of the bricks produced in this way is more than double than that of the old brickfields and lead less than 5% rejects as compared to 25% for the old method. The price of energy saving automated brick technology bricks is also competitive. According to the owner of the Diamond Auto Brick Field, per piece green brick is of Tk 6 and the old one is of Tk 5.50-5.80.

(Figure-1)

	<b>energy saving automated brick technology</b>	<b>Old Type Brick</b>
<b>Set up cost for Brickfield</b>	5-8 crore (Tk.)	1 crore (Tk.)
<b>Price (per piece)</b>	Tk. 6	Tk. 5.50- Tk. 5.80
<b>Production (annual)</b>	3 crore	2 crore
<b>Coal required for 100,000 bricks</b>	12.7-14 ton	56 ton

A Comparison between Old type Brick and energy saving automated brick technology (in daily production of 1,00,000 pieces)

**Energy saving automated brick technology have some usefulness, they are -**

#### **Automated Process**

The production process is fully automated. After the production for drying the bricks a few number of people are needed; i.e., for monthly production of 40,000 bricks, it takes 40 to 50 labors at the highest.

#### **Extremely Large Demand**

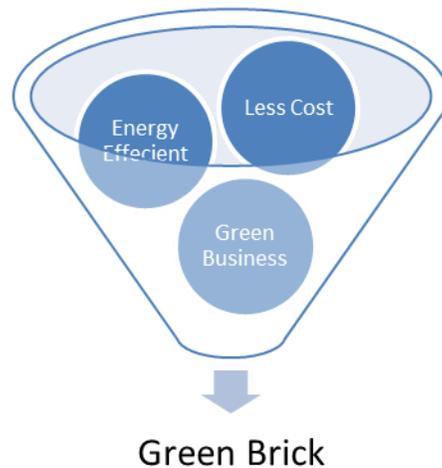
With the increase in the prices of primary electricity and higher production and sales, such as the demand for real estate and the real estate business in Bangladesh, the average demand for such bricks is increasing and green bricks always save as a priority.

#### **Assemble through Carbon Credit**

Less carbon emissions are available in the air, from the developed countries, an annual income of 2 million can be found.

### **Secured & Quick of Investment**

According to Auto Greene Brick Field in Ashulia, the cost of production of prescribed production and green brick kiln was recovered within just one year.



### **Carbon Credit Market and Energy Saving Brickfield**

at present, 6000 old brickfields are emitting 8.75 million tons carbon annually. According to the UNDP, Bangladesh uses about 23 tons of coal to produce 100,000 bricks, compared with China, which uses 7.8 to 8 tons of coal to produce the same amount, source (The Daily Ittefaq, 2009). Bangladesh's brick industry has grown approximately 5.8 percent during the last decade- it represents one of the largest sources of greenhouse gas emissions in the country. In the Figure 4 we find that in 2010, total carbon dioxide emissions in whole world reached 50.39 million Metric Tons (mn MT); within which estimated at 35 million tons of carbon dioxide due to the use of automated technologies and substandard fuels such as wood, sulphur coal and the burning of tires. The figure also suggest that on a per capita basis meanwhile, Bangladesh is ranked at 172 worldwide, with per capita emissions increasing on 2010 by 0.02 metric tons to 0.33 metric tons. By following the vulnerable situation, UNDP is providing the energy efficient brick making technology Hybrid Hoffman Kiln (HHK) to make clean bricks (The News Today, 2011) and reduce carbon emission. The annual greenhouse gas emissions by the old brickfield is equivalent to emissions of more than 230,000 passenger vehicles or carbon sequestered by more than 250,000 acres of pine or fir forests. A single kiln that runs on HHK technology will produce 15 million bricks and cut carbon emission by 5,000 tons a year. A double unit kiln will produce 30 million bricks and cut carbon dioxide (CO<sub>2</sub>) emission every year (Byron, 2009). The secret to the Hybrid Hoffman Kiln's success is its ability to completely burn most of the fuel that is mixed

into the bricks during firing, and thereby drastically reduce energy use. It also dries the bricks by directing hot air into the tunnel from the annular kiln, which blocks greenhouse gas emission (UNDP, 2011).

However, Bangladesh can earn substantial revenue through selling carbon as carbon credit like China and India in the international market by using modern technology in brickfields surrounding Dhaka city. According to the Collins English Dictionary carbon credit is a certificate showing that a government or company has paid to have a certain amount of carbon dioxide removed from the environment. Emission trading is another term related to carbon trading is a market based approach which is used to control pollution by receiving economic incentives for achieving reductions in the emissions of pollutants (i.e., carbon etc.).

As per the guidelines of the Kyoto protocol, Bangladesh will get 15.20 dollars from the global Community Development Carbon Fund for reducing each ton of carbon emissions (The Daily Ittefaq, 2009). From this point of view if Bangladesh can reduce the amount of emissions at least 50% of 8.75 (4.17%) million tons through technology transfer, the country will get huge revenue amounted \$70 million a year from global carbon trading fund. A country's leading non-banking financial institution, Industrial and Infrastructure Development Finance Company (IIDFC) has already entered into two agreements named "emission reduction purchase agreements (ERPA)" with the World Bank and the Danish Energy Agency (DEA) to help in reducing carbon emissions from brickfields. As per agreements, the World Bank and Denmark will buy 189,000 and 60,000 emission reductions respectively (Khan, 2009).

## **Findings**

Energy saving automated brickfield technology is beneficial both for humanity and environment. Lower loss of fire woods, less burning of coals, low demand for clay, low intervention of human bodies etc. are the different encouraging sides of Energy Saving Automated Brickfield Technology. The analysis suggested that, any energy saving automated brickfield technology producing 70,000 bricks daily need maximum 40 labors. Bangladesh can achieve Tk. 200,000 for five years' production of grin brick for reducing carbon emission. As Energy Saving Automated Brickfield Technology ensures whole year productivity rather than seasonal

productivity it can easily cope with increasing demands of bricks in Bangladesh. Beside Bangladesh Bank is well aware of the environment degradation situation as mentioned above and has already given time to time directions to all scheduled banks for green finance. Commercial banks are now required to ensure necessary measures to protect environmental pollution while financing a new energy saving project like as energy saving automated brickfield. All banks adopt environmentally responsible financing, weighing up environmental risks of project before making financing decision so financing is not a big problem for energy saving automated brickfield. Green finance work for environmental risk management in consideration as a part of green financing. Bangladesh bank will declare the names of the top ten banks for their overall performance in green financing activities in the BB websites.

### **Recommendations:**

Government need to push people by creating awareness against traditional kilns and make the technology simply available to the brick manufacturers. Electronic and print media should come forward to encourage people for using such kinds of bricks. More marketing is required to familiarize people with green bricks. To encourage entrepreneurs, banks need to provide long-term loan. But the problem is in receiving loan from banks, an entrepreneur has to complete a large number of formalities including verification of certificates and licenses. To avoid such unfairness policy makers should make process this easy and should modernize the policies and regulations with demand of time.

### **Conclusion**

At present energy saving automated brickfield technology has been branded as one of the most important fact for the fresh environment. From 2011 Bangladesh bank has launched green financing in the financial sector. Now-a-days Bangladesh Bank already made significant head way, motivating bankers into activism towards environmental awareness and environmental financing. Bangladesh bank has also extended a refinance scheme of Tk. 200 crore in 2011 to establish and spread the technology. Different banks have already started providing loan for energy saving automated Brickfield establishment with payback period of 5 years. Government need to push people by creating awareness against old brick field and make the technology simply available to the brick manufacturers. Electronic and print media should come forward to encourage people for using such kinds of bricks. More marketing is required to familiarize people with energy saving automated brickfield. All private bank try encourage entrepreneurs for

long-term loan to make energy saving automated brickfield. From 31st December, 2012 all the old brick fields lost their validity for working which will also reinforce traditional brick makers to collapse their production and start with energy saving automated brickfield system.

Using energy saving automated brickfield may easily reimburse bank's loan within a year. Time has come to take right measures to protect our environment and turn our country into a better living place for the next generation. The banking sector can play a pivotal role in green financing. If we are able to mobilize cash to facilitate energy saving automated brickfield it will bring a fresh environment as early as possible. If green finance failure it will bring a profound impact on our environment. Whether the ambitious climate and sustainability goals can be achieved, will depend significantly on the determination with which these actors drive the development of green banking forward.

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