



Greening of industries in Bangladesh: pollution prevention practices



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ABSTRACT

Industry has contributed to serious and widespread deterioration in the quality of water, land and air in Bangladesh. The objectives of the study are: to document pollution prevention options and their current use in Bangladesh; to compare practices across five different highly polluting industries; and to contribute to the pollution prevention literature from a developing country's perspective. The study is an exploratory one, using both primary and secondary data. Five industries were selected from the top-ten environment polluting industries in Bangladesh; these are the tannery, pulp & paper, fertilizer, textile and cement industries. From each industry group, two sample plants were selected with five executives participating from each plant. This study highlights the reality of Bangladeshi industrial plants in applying pollution prevention initiatives. It reveals that compared to leading firms in developed countries, pollution prevention initiatives in Bangladesh are considerably underutilized. All of the industries undertook some pollution prevention activities, though each of them had potential for improvement. For example, none of the case sites engaged in pollution prevention through designing environmentally compatible products.

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1. Introduction

Many business organizations are now paying attention to the natural environment (Forbes and Jermier, 2010). Over the past 30 years environmental concerns have increasingly spread throughout the body of environmental management literature (Harris and Crane, 2002). The concepts of 'management' and 'environmental preservation' have become essential to the business world due to the emergence of new outlooks on environmental management (Silva and Medeiros, 2004). In order to maintain and improve the quality of the environment through preventing industrial pollution, a paradigm change in conventional management to environment management is necessary (Forbes and Jermier, 2010). The adoption of environmental management and compliance with environmental regulations can increase the productivity of, as well as protect, the natural environment; "environmental management

has considerable potential to contribute to both economic and environmental sustainability" (Michael et al., 2010, p. 476). Stakeholders' preferences bring financial gains for a firm, but they also drive their environmental or social responsibilities (Forbes and Jermier, 2010). However, little is known about environmental management practices in developing countries such as Bangladesh, even though Asian developing countries need to adopt it as a strategic vision and as a strategic approach if environmental degradation is to be avoided (Chiu and Yong, 2004).

The purpose of this study is threefold:

- to document pollution prevention improvement options and their current usage in Bangladesh;
- to compare practices across five different highly polluting industries; and
- to contribute to the pollution prevention literature from a developing country's perspective.

The research uses a combination of primary and secondary data to study current and potential pollution prevention initiatives in the tannery, pulp and paper, fertilizer, textile and cement industries in Chittagong, Bangladesh. The paper begins with literature on environmental management, and industrial pollution prevention in general and in Bangladesh.

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1.1. Environmental management

Environmental management has become a strategic business issue (Corbett and Cutler, 2000). Environmental management as a competitive priority for manufacturing by using the 3R principles: reduce, recycle and reutilization (Jabbour et al., 2012). There are many opportunities for companies to create innovative solutions that reconcile prosperity with environmental protection. Wally and Whitehead (1994) argue that the environment is no longer a cost of doing business, rather it is a catalyst for constant innovation, new market opportunity and wealth creation. The study by Denton (1996) reveals that if a company considers the environment as a cost, rather than as a chance to achieve a competitive advantage, perhaps it would miss its greatest opportunity. Thus, business organizations have already begun incorporating environmental aspects into their marketing strategies to remain competitive in the marketplace (Solaiman and Aktaruzzaman, 2000). Some companies are now using environmental issues to strengthen their market position and to access new markets. Korean industries integrated environmental issues into their corporate strategies in response to external business atmosphere (Park and Ahn, 2012). China witnessed a rapid increase in the number of ISO 14001 certification (Qi et al., 2011).

Addressing environmental issues cuts costs, improves efficiency, improves a company's image, and reduces insurance premiums (Denton, 1996). Environmentally sound products and processes also enhance corporate and brand image. Gallarotti's (1995) study shows that consumers' preferences have shifted from environmentally unsound products to environmentally sound products. Products marketed as environmentally friendly are currently becoming widely accessible, offering consumers new ways to express green values and attitudes (Jansson, 2011).

Nowadays, corporate business leaders have become more serious and responsive to protecting the natural environment, in part due to rising public attention toward environmental issues (Qi et al., 2011). Presently, company executives are working alongside environmentalists to find ways to reduce pollution, creating a 'win-win' situation (Clarke and Fuller, 2011). Pollution prevention protects the environment, consumers and workers; in addition, the improvement of industrial efficiency, profitability and competitiveness can be achieved (Ngwakwe, 2011).

1.2. Industrial pollution prevention

Pollution prevention has become an important issue for manufacturers (Jabbour et al., 2012). Pollution prevention refers to any in-plant practices of industrial plants, which eliminates the amount of pollutants that would have been released to the natural environment at the source (Ngwakwe, 2011; Asian Development Bank, 1994). Pollution prevention strategies are receiving significant attention in industrial plants all over the world, complementing end-of-pipe pollution control and management strategies (Hossain et al., 2008). From a sustainability perspective, any solution should encourage pollution prevention at source (Kathuria, 2009). Theyel (2000) argues that industry should address the environmental sustainability of industrial production by integrating environment management practices with industrial operation. Further, environmental planning is being included in production processes, starting from product and process design to preventing pollution at the source, instead of managing hazardous waste following industrial plant pollution generation (Theyel, 2000). Environmental aspects are associated with firms' raw material procurement, manufacturing processes, energy usage, product development, marketing, disposal, and waste management (Banerjee, 2001).

Pollution prevention reduces or eliminates waste at the source by modifying production processes, promoting the use of non-toxic

or less-toxic substances (Munguia et al., 2010). Pollution prevention can consequently help firms to reach a win-win situation in which to ensure both the firm and the environment will benefit (Molina-Azorin et al., 2009), thus "voluntary approaches to industry-wide pollution prevention programs have gained a global impetus" (Hughey and Chittock, 2011, p. 552). Even so, "companies need a mix of strategies to make a business case to implement pollution prevention measures" (Granek, 2011, p. 560). The classifications of technical approaches to pollution prevention are as follows:

Developing countries have benefited from industrialization, but at the same time are suffering from the environmental deterioration resulting from this; people of China have begun to pay better attention to this in recent decades (Ling and Issac, 1996). Recently, some tanneries in Chinese rich provinces such as Zhejiang and Jiangsu have been closed down or transferred to remote areas due to generation of heavy pollution (Jian et al., 2011). In Brazil, the adoption of pollution prevention approaches still find a certain resistance among companies, which have seen it more as an additional cost than an improvement opportunity (Silva and Medeiros, 2004).

The literature review uncovers that most of the studies on this research issue have been conducted in industrially developed countries. No comprehensive study has yet been undertaken in the context of Bangladesh to highlight Bangladeshi pollution prevention practices in multiple industries. This research gap motivates this study.

1.3. Bangladesh and industrial pollution prevention

Bangladesh, a South Asian country, gained independence from Pakistan after the nine months liberation war in 1971 (Sobhani et al., 2009). In Bangladesh, a number of industrial plants were established in different areas of the country following independence in 1971; however, environmental issues were not considered seriously at that time. Thus, the natural environment has been continuously degrading due to industrial enterprises' unsustainable practices. Rahman's (1992) study reveals that many people are being affected by the resultant industrial pollution in Bangladesh. The national pollution profile also shows that industrial sub-sectors contribute to a large percentage of pollution loads in the country (Islam and Miah, 2003). One government document (Government of Bangladesh, 1999) reveals that most of Bangladesh's old industries are not equipped with treatment facilities, and, as a result, they give rise to the dumping of untreated effluents into the country's lakes, lagoons and rivers. Another report, the People's Report on Bangladesh Environment—2001, details that a major portion of industrial waste is discharged into surface water bodies without any kind of treatment in Bangladesh (Rahman et al., 2001). A survey by the Department of Environment (DoE) found that tanneries do not treat effluents (exception is the Bata tannery in Nayarhat) and that textile dyeing and printing industries dump their untreated effluents into water bodies (Huque, 1994). There are more than 200 tannery plants in Hazaribagh, and not one of these plants has a waste treatment facility, nor is there a central waste treatment plant (Gain, 2001). Mitu (2006) reports that the government has yet to adopt any firm policy to reduce the pollution generated from tanneries and pharmaceutical, chemical and dyeing factories, which all release highly toxic untreated wastes.

Bangladesh is facing crucial choices regarding industrialization and environmental protection; a choice that necessitates the adaptation of preventive measures of industrial pollution. According to the report on Industrial Pollution Control Management in Bangladesh (Government of Bangladesh, 1995) the implementation of pollution prevention programs need to take place on a nationwide scale. It has been suggested by the Asian Development Bank

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