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Small Manufacturing Industries: The Impact of Environmental Regulation

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Abstract

This paper examines the impact of environmental issues on small Indian enterprises. Due to India’s rapid industrialization the environment is now becoming more of a major business concern. This paper compares small with large enterprises to see if there are any differences in the way they approach environmental issues. Small firms in particular, have been encouraged and given due assistance by the Indian government but this policy now conflicts with India’s environmental responsibilities as findings in this paper indicates they poorly respond to attaining social responsibility and acknowledging environmental policies.

Key Words: Environment, India, Small Enterprises and Regulation.

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INTRODUCTION

India is one of the world’s major emerging economies having a tremendous manufacturing base. The introduction of economic reforms in 1991 drew interest not only from academic researchers, analysts and the financial media but also from investors. India is viewed as a country that is emerging as a potentially promising business opportunity (Stinerock, 1996) especially in the case of manufacturing where resource and labour costs have a competitive advantage. However, though there are global opportunities and manufacturing has its cost advantages, unfortunately, with manufacturing comes industrial pollution. In India industrial pollution is regarded as the major contributor amongst the many negative environmental impacts that are causing damage through excessive exploitation of resources and degradation of the environment. The Bhopal tragedy vividly demonstrated the laxity of enforcement of India's environmental standards (Cohen, 1994). The significance of this accident, however, extends well beyond avoiding such a disaster in the future but for companies to actively consider environmental issues as part of their strategy development. Since the legacy of Bhopal, large manufacturing enterprises in India such as Reliance Industries, Tata Chemicals and Indian Petrochemicals Corp. have committed themselves to taking actions that minimize their impact on the environment. The major problem lies however, with the high level of pollution emitted by small and medium enterprises.

The importance of industrialization in economic development is crucial for a growing economy with a large population like India. Prosperity through industrialization has been a long-term strategy for the Indian government. Communities, businesses and governments have debated the results of industrialization, a debate that has continued
unabated. Reliance on agriculture and a large population has retarded India's development in the past. Industrialization is seen as a synonym for economic development as a means to conquer poverty and raise the standard of living. With this as their focus, the government has encouraged small enterprises in their growth and survival.

ENVIRONMENTAL MANAGEMENT ISSUES:

Corporate environmental consciousness began with corporations worldwide including environmental criteria and or environmental issues into their objectives and strategies (Drumwright, 1994; Sheth and Parvartiyar, 1995). Farsighted corporations who saw the green movement picking up momentum soon involved themselves with the concept of environmentalism. Corporations have realized that incorporating environmental management issues in their strategies provided an excellent opportunity to gain market share (Saunders & McGovern, 1993; Porter & Van der Linde, 1995a; Scerbinski, 1991; Ottman, 1993, Fitzgerald, 1993) and in addition they found that if they exclude environmental issues from their objectives, they risk losing their competitive position in the long run (Bennett, 1993). In recent times, most organisations, corporations, industries and businesses have incorporated the 'environmental criteria' discourse of protecting the environment through sustainable development, a subject that is of growing international concern.

Obviously, not all countries take the same stance on environmental issues. The debate between the developed and developing worlds is still continuing. Differences will exist but there is a need to distinguish between rich, emerging and poor countries with respect to environmental development, ecological performance and
sustainability. Hart (1997) identified this problem of a growing population, rapid economic development and political and social demands that exceed the mandate and capabilities of any corporation in an emerging economy.

Paul Ehrlich's book the Club of Rome's *Limits to Growth* drew on the realisation that we live in a finite world in which the euphoric economic growth and population expansion would eventually exhaust the natural resources. This was not met without controversy and the problems that emerged in the 1980s were now not concerned with the inputs but dealt more with the other half of the Limits to growth agenda i.e. the effect on the environment of the outputs of indiscriminate economic growth (Peattie, 1995). That is when the community, businesses and governments started debating on the results of industrialization that had continued to grow unabated. The importance of industrialisation in economic development is crucial for a growing economy like India. Labour productivity is highest in the manufacturing industries, this assist in raising national income at a faster pace. It is a precondition for agricultural development and it induces development in other sectors (Tiwary and Singh, 1990). Said (1997) provides two logical solutions to Erlich's theory, one is that humanity should breed less and the other is that we consume less and produce lower environmental impacts in the process.

Assumingly, if industry is to operate within a level of global environmental quality that is not deteriorating, it must reduce its global environmental impact. The problem can be far more crucial for India if they have crossed the threshold of an acceptable or sustainable level of environmental quality. Another way of addressing this is by using sustainable inputs in the environmentally friendly manufacturing process resulting in
greener outputs or product stewardship. This would qualify provided that the end users be it industry or consumers are committed to using green products.

Generally it has been found that green policies are imposed by government through regulation but over time, as green issues permeate the marketplace, consumers will demand products that are environmentally friendly, companies rather than seeing green issues as a regulatory burden have now started to see this trend as an opportunity from which they can benefit (Menon & Menon, 1997). Johannson's (1994) proposition of a trisect by which sustainable business is based on the concept of balancing ecological, economic and social factors that are included in the company’s value system and must be included in the business planning or design phase resulting in profits through ecologically sound products, processes or services. Firms perform well with ecologically sound practices. Porter and Linde (1995), remarked that environmental regulations could spur innovations that increase product value and decrease total costs. The tradeoff between economy and environment for production processes, customer needs and technology is dynamic and complex. Enterprises, both large and small in emerging economies such as India as they industrialize are beginning to feel the impact of balancing industrial growth with environmental responsibility.

**INDIAN GOVERNMENT POLICIES**

Small enterprises play an important role in the Indian economy as they are labour intensive and generate employment opportunities. Small companies are defined as those with less than US$180,000 in capital equipment (US-AEP, 1996). These enterprises offer a higher return on investment as they use less capital and the cost of
labour is low. The Indian government's policy of encouraging small enterprises has helped in the dispersal of industries around the country, rural development and in the decentralization of economic power of the population base.

In addition, the government's policies have supported entrepreneurial talent and skills, stimulated personal savings and helped in developing innovative and locally appropriate indigenous technology. This has provided a degree of dynamism to the economy and has contributed to the development of competition (Rajendran, 1989). As a consequence these industries are supported and have been encouraged. No public or private enterprise with about 100 employees has been allowed to go out of business (US-AEP, 1996). The government's support of the small enterprise sector has resulted several policy initiatives and actions. They have assisted in providing measures such as greater infrastructural support, easier availability of credit, lower rates of import-export duty and export incentives (Parthasarathy, 1996).

The contribution of small-scale industry to India's industrial production, exports and employment is significant. About 3 million small enterprises employing nearly 16.7 million persons, accounts for a share of 35% of India's total exports and about 40% of its industrial manufactures (SIDBI, 1997). In real terms, the small-scale sector recorded a growth rate of 10.1% in 1994-95 as against 7.1% in 1993-94 and 5.6% in 1992-93 (Parthasarathy, 1996).

Despite the tremendous contributions these small manufacturing enterprises make to the economy, they are also the worst polluters. For a long time this has gone unnoticed. The government has developed strict environmental laws and regulatory
controls. In the 1970s India developed environmental laws and regulations. The first of India’s modern environmental laws was the Water (Prevention and Control of Pollution) Act of 1974, which established the Central and State Water Pollution Control Boards; The Air (Prevention and Control of Pollution) Act of 1981; and the Environment (Protection) Act of 1986. The latter is umbrella legislation designed to provide a framework for the central government. The problem in India is not insufficient laws or regulatory mechanisms that can control pollution but as the World Bank has stated that these regulatory boards have been plagued by poor enforcement due to political interference and as with other enforcement activities in India, corruption is pervasive (US-AEP, 1996).

Another point worth noting is that the mandate of the Central Pollution Control Board (CPCB) is to set environmental standards for all plants India wide, lay down ambient standards and coordinate the activities of the State Pollution Control Boards (SPCBs). Unfortunately, the implementation of environmental laws and their enforcement are decentralized and are the responsibility of the SPCBs (Mani et al., 1997) and hence not subject to scrutiny by the CPCB. This is an ad hoc method of addressing key environmental issues.

Regulatory compliance by small enterprises has been a major issue. Environmental legislation in India although seemingly as tough as that in major developed nations, is not well enforced. Though multinationals and large domestic companies are monitored, poorly funded regulatory bodies find it nearly impossible to police the millions of small-scale enterprises. The bribing of poorly paid inspectors is reported to be common (Roberts, 1995).
In addition, pollution control laws have achieved little success. Slow responses by the courts to respond to enforcement actions sought by state pollution control boards, poor funding of the boards themselves, and charges of corruption have been regular and widespread (US-AEP, 1996). These have all contributed to the lack of success in racking down on violators.

**OBJECTIVES OF THE STUDY**

This paper is an exploratory study of Indian small enterprises. The central thrust of this study is to compare the importance of environmental managerial issues between small and large firms.

The objectives of this study are:

- to highlight the environmental problems caused by small enterprises
- to examine environmental issues from a recent survey of manufacturing enterprises in India and
- to examine whether the attention to environmental issues varies between small and large industries.

**METHODOLOGY**

*Sample design:*

The survey was undertaken from two states, both industrially developed and high growth areas; Gujarat and Maharashtra were selected for the study. It was decided to take the most industrialised town in each selected state. Ahmedabad in Gujarat and Poona in Maharashtra were selected for the field study.
**Industry Sectors:**

Enterprises in the most polluting industry sectors were selected and in order to maintain comparability the same sectors were surveyed in both towns. The sectors identified were chemicals, leather and textiles as these are most polluting industry sectors.

In all, 200 small enterprises and 200 large enterprises were randomly selected from each town from the lists provided by the District Industry Centers. Before drawing the sample, the enterprises were stratified into four groups tiny, small, medium and large according to their present investment in plant and machinery at purchase prices. The data was collected using a structured questionnaire. Either managers or owners were asked to respond to the questionnaire. Key personnel from the State Financial Corporation, banks and State Government Industry Departments in each state were also interviewed to understand the nature of the support system and role they play to make it viable for enterprises to operate.

**Response rate:**

Of the 400 questionnaires delivered, 31.5% (63) responses were obtained from small enterprises and 24.5% (49) from large enterprises were returned. It may be clarified at this stage that the analysis is primarily based on self-perceptions of those individuals completing the questionnaire. In most cases respondents were asked to reply ‘yes’ or ‘no’ to a close end question. Besides, in some cases they were not able to provide hard data to substantiate the realised impact. The questionnaire also asked for additional information about the characteristics of the firms. However, it was
confined to only urban areas and not the rural and less developed areas. Therefore, it is difficult to draw generalizations on this basis.

Chi Square analysis was used to test whether there is a relationship between enterprise size and the various factors mentioned in the hypotheses below.

**HYPOTHESES**

*Green Vision:*

There is a propensity for small firms to have a low level of environmental awareness and commitment. Large firms have taken this issue more seriously and they have been more effective in achieving pollution compliance than small industries (US-AEP, 1996). Today's technology and strategic planning can be effective tools in reducing negative environmental impacts. The green challenge is an issue that is relevant to every firm big or small. Every business large or small faces pressure to improve its eco-performance.

A green vision or green objective is a major criterion that firms can adopt to effectively enhance their green marketing and managerial abilities. The first two hypotheses examine the impact of Indian enterprises to environmental issues. They are:

H1: There is no significant difference between large and small enterprises' review of environmental pollution issues.

H2: There is no significant difference between large and small enterprises' reasons for installing pollution control equipment.
Green Processes & Regulation:

Besides, being competitive in the market place large and small enterprises are largely responsible to a number of different stakeholder groups, including owners, customers, suppliers, employees, financial institutions, government regulators and the public at large.

H3: There is no significant difference between enterprise size and the use of green manufacturing processes
H4: There is no significant difference between enterprise size and regulatory compliance

RESULTS AND DISCUSSION

Green Vision:

The first hypothesis, H1: There is no significant difference between large and small firms review of environmental pollution issues was rejected at the 0.05 level of significance (Chi Squared = 93.1, df = 2, p < 0.05). Hence there was found to be a difference between the enterprise size and the enterprise's review of environmental pollution issues for this sample.

Chi Square testing indicated that the second hypothesis, H2: There is no significant difference between large and small enterprises reasons for installing pollution control equipment is rejected at the 0.05 level of significance (Chi Squared = 59.2, df = 2, p < 0.05). There is a difference between enterprise size and installation of pollution control equipment. Hence there is a difference between enterprise size and the decision to install pollution control equipment in this sample.
In the past, pollution from small enterprises has been overlooked. Industrial effluent largely comes from the 3 million small and medium-sized enterprises that are scattered throughout the country, particularly in the production of paper, sugar, leather, textiles and chemicals. Unfortunately, only about half of the medium- to large-scale enterprises have partial or complete effluent treatment. Four-fold industrial growth during the period 1963–91 resulted in a six-fold increase in toxic releases. Heavy industries like iron and steel contribute nearly 70% of the toxic releases but only 20% of industrial output. Industrial disposal of polluted effluent occurs via open drains into streams and reservoirs or through underground injection. Most industrial estates lack wastewater treatment systems (US-AEP, 1996). The study did show that most industries emitted all three types of pollutants as indicated in table 1.

Table 1

<table>
<thead>
<tr>
<th>Enterprise Type</th>
<th>Air Emissions</th>
<th>Water Effluents</th>
<th>Solid Wastes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>92%</td>
<td>87%</td>
<td>100%</td>
</tr>
<tr>
<td>Large</td>
<td>88%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Out of the 63 small enterprises that responded, 92% admitted to air emissions. Only 7.9% had air pollution control equipment. In the case of water effluents from small enterprises, 1.6% treated the effluents and discharged, 98.4% discharged untreated and not one small enterprise recycles their water effluents. In the case of solid waste,
the municipality-collected majority of the waste and 1.6% of small enterprises recycled their solid wastes.

Out of the 49 large enterprises that responded, 88% admitted to air emissions. With all of these having air pollution control equipment. In the case of water effluents from large enterprises, 6.1% treated the effluents and discharged, 63.3 % discharged untreated and 18.5% large enterprises recycles their water effluents. In the case of solid waste 6.1 was recycled and the majority of the waste was collected by the municipality.

With respect to the question how frequently the firms reviewed environmental pollution issues. Four alternatives were made available i.e. not at all, fortnightly, monthly and other. No responses were given for other. All 63 small enterprises surveyed responded not at all whereas, the large enterprises responded 5 – not at all, 19 fortnightly, 25 monthly.

**Green Processes:**

Companies globally, are utilizing green manufacturing processes to be competitive in the market place. A green product is one that meets consumer’s needs, is socially acceptable, and is produced in a sustainable manner (Peattie, 1995). Viewed as a competitive and strategic challenge, organisations are resorting to manufacturing lifecycle analysis, environmental auditing and environmental reporting (Elkington, 1994). The reality is that an enterprise cannot consider making a product ecologically sound without considering how its raw material acquisition, development, manufacturing, distribution, sales and disposal systems impact on the environment
(Wasik, 1996). Johannson (1994) has gone one step further by stating that managers in a green venture start from a different mindset. They recognize that becoming green is an opportunity to establish a unique position in a niche market or, by being able to produce a higher value product with fewer resources, gain a competitive advantage.

Chi Square testing indicated that the third hypothesis, H3: There is no significant difference between enterprise size and the use of green manufacturing processes is rejected at the 0.05 level of significance (Chi Squared = 75.0, df = 2, p < 0.05). There is a difference between firm size and the use of green manufacturing processes based on the data from this sample.

**Regulatory Problems:**

Many manufacturers have responded positively to the green agenda. However, it is debatable whether this is out of genuine concern, or to comply with environmental legislation, or out of need to maintain market share in an increasingly competitive atmosphere by reacting to green consumer behaviour (Titterington, Davies, Cochrane, 1996).

Some environmentalists in India have viewed enforcement as lax, despite the regulatory framework and oversight authority of the Central and State regulatory boards. There have minimal incentives for enterprises to invest in pollution control because of weak monitoring and enforcement of the environmental regulations (Dasgupta et al., 1997). Based on the survey results, of the 63 responding small enterprises when asked if the incentives for compliance of existing regulations were adequate 7.9% replied yes and 92.1% replied no. Whereas, with respect to the 40
large enterprises 55.1% replied yes and 44.9% said no. From these responses it seems that small enterprises are most likely to feel that they lack incentives to set up treatment equipment, or operate equipment if it already installed because operating it is more expensive than non-compliance.

Chi Square testing indicated that the hypothesis, H4: There is no significant difference between firm size and regulatory compliance is rejected at the 0.05 level of significance (Chi Squared = 30.0, df = 1, p <0.05). There is a difference between firm size and regulatory compliance in this sample. Hence there is a difference between enterprise and regulatory compliance in this sample.

The reasons that most of the 63 small enterprises gave for installing pollution control equipment were statutory legal requirements (87.3%) as opposed to economic reasons (i.e. to reduce operating costs) (12.7%) and no small enterprise gave social responsibility as a reason for installing pollution control equipment. On the other hand large enterprises stated that they installed pollution control equipment to meet statutory legal requirements (34.7%). Social responsibility objectives accounted for 65.3% of the reasons and no large enterprise gave economic reasons for such installation.

As indicated from the survey, image consciousness is more of a concern for large enterprises whereas; the small enterprises place more emphasis on meeting statutory requirements. Large enterprises could possibly be more fearful of the negative publicity they would receive should it become publicly know that they have not complied with pollution control requirements. This could be contributed to the fear of
the risk or penalty involved. Research conducted by Lau and Srinivasan (1997) found that the potential driving force for better environmental performance is driven largely by a fear of the penalty that can be imposed by government when environmental laws are violated.

Cornell and Shapiro (1987) stated that firm value depended on the cost of explicit and implicit environmental claims. Explicit claims of the stockholders can be recognized but the implicit claims of the firm cannot be ignored. If the firm fails to address with social responsibility, parties to implicit contracts like consumers or regulatory agencies can force burdensome explicit contracts on the firm. Their explanation does widely support the actions large enterprises. In the case of small enterprises as in the survey sample social responsibility reasons for installing pollution control equipment were totally ignored because of their resource restrictions small enterprises tend to minimize expenditure that does not directly contribute to the bottom line.

With respect to regulatory pressure and compliance, many businesses spend more time in fighting (or trying to avoid compliance with) regulations that they take a less proactive, strategic approach to environmental management (Schoemaker and Schoemaker, 1995). Indian courts closed almost 1,000 factories for pollution infringements and the Supreme Court fined 15 plants, including some multinationals (Shaman, 1996). Closure and noncompliance are quite regular. It could be worth considering Johansson (1994) view on a “green firm”. It is addressed as one that does not look at regulatory or legal compliance as a first step. Merely complying with regulations is a poor strategy and can be cost ineffective. Much of the literature seeks to establish that there is an acute need for regulatory and legal measures but pressure
for the green vision for these small enterprises will have to come from within these small industries based on green consumer demands.

Interestingly, one would imagine that because the government heavily supports small enterprises, availability of finance for pollution control measures would not be a problem. However, 100% of the small enterprises that responded to the survey mentioned that access to finance for pollution control measures was a major problem. By comparison, of the large enterprises that responded to the survey 34.7% said finance was a major problem, 61.2% stated it was a minor problem and 4.1% said it was not a problem. Small enterprises also lack additional space for pollution control facilities. There are difficulties in obtaining technical assistance of knowledgeable consultants. Since most of the small enterprises are widely dispersed, it is difficult for them to be able to develop a joint treatment plant. The fear of depressed profit margins and decline in competitiveness restricts these enterprises from using pollution control measures. More emphasis is paid on new investments that generate high levels of returns. Soft loans for pollution control measures are not lucrative. There are subsidies offered for investments in pollution control measures as incentives but the impact of these incentives on these enterprises is little or nothing for they do not alter the cost-benefit analysis in favour of pollution control investments (Nyati, 1988).

LIMITATIONS OF THE STUDY

The following are the limitations of the study:

- The size of the sample surveyed is very small compared to the number of manufacturing enterprises in India. Only two towns out of two states in India
were examined. These were highly industrialized towns in highly developed states.

- These are not representative of India as a whole. The inclusion of rural and less developed states and regions could give different results.
- Other factors such as the impact of the political and economic system and organisational structures of the enterprises were not explicitly considered.

CONCLUSIONS

Enterprises, whether they are large or small, low-tech or hi-tech, manufacturing or agricultural, all inevitably produce discharges and wastes that are capable of polluting. Not many enterprises have developed strategies for sustainable production in a country like India, where high population and economic growth demands resources (inputs) and creates discharges (outputs) in the form of pollutants, thus putting pressure on the environment. Welford (1996) suggested that it is sustainability that challenges business to produce high levels of output while using lower levels of inputs and generating less wastes. The survey that was conducted highlighted the problem that is faced in India with respect to balancing the demand between industrialization and sustainability of environment. In responding to the survey, it was seen that small enterprises were basically concerned with the bottom line and that sustainable development and green issues did not enter in these enterprises' business strategies or operations. Based on the hypothesis testing on the admittedly small number of respondents it was found that large enterprises tended to concern themselves more with environmental issues than small ones. Large enterprises were more concerned about maintaining a positive public image and avoid negative publicity associated with infringements against regulations. Also, due to their high
level of financial resources and public visibility they are more likely to be targeted by regulators.

Environmental policy implementation in the case of small industries where the past structures which have been predominantly using the command and control approach rather than market based instruments have resulted in high cost regulatory structures should focus more on introducing new technologies that meet the ambient standards.

Secondly, since the cost of compliance has been much higher than non-compliance for industries. Low non-compliance costs and heavy reliance on unethical procedures have made it easy for firms to resort to non-complying options and litigation.

Lastly the costs of administrating environmental regulations have been far more expensive to administer within the small enterprise groups.

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