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Integrating Environmental Management in Small Industries of India

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This paper investigates small industries in India. The central discussion of this paper highlights the importance of small industries and their role in the economy. Despite their importance, small industries pollute and are faced with numerous problems-major and minor. Technical and financial issues are problems that can be handled internally but external problems such as legislative and regulative compliance should be addressed efficiently. This article seeks to shed some light on small manufacturing industries and their environmental performance. An attempt is made to address some solutions that can improve environmental quality within these small industries by focusing on "a sustainable vision"-i.e. a trade off between economic growth, profitability, and sustainable environment.

The focus on environmental impact has been on the rise and companies are struggling to keep up (Gupta & Sharma, 1996). As this trend continues the question arises of how best should industries manage productivity and at the same time increase profits without causing damage to the environment. This challenge is faced by Indian industries, and in addition, they are faced with the problem of how to effectively make use of their processes and deliver environmentally friendly products. In India, industrial pollution is regarded the worst among the many environmental impacts that are causing damage through excessive exploitation of resources and degradation of the environment. The Bhopal (India) tragedy clearly demonstrated one of the world's worst industrial accidents. The significance of this accident, however, extends well beyond avoiding such a disaster and a need to move beyond just polluting the environment. Since the legacy of Bhopal, large manufacturing houses in India (such as Reliance Industries, Tata Chemicals, Indian Petrochemicals Corp. etc.) have all committed themselves to the environmental movement. However, the crux of the problem is the pollution generated by small and medium industries. Although they are promoted in a large way by the Indian government and play an important role within the economy with their prime role and vast scope in employment, the unsafe environmental practices of these industries for a long time have gone unnoticed. The collective environmental damage done by small industries can obviously be much higher than envisaged.

This paper is a study on small industries in India. The central purpose of

this paper is to highlight the importance of small industries and their role in the economy. Despite their importance, research has indicated that they are the worst polluters and are faced with numerous problems-major and minor (Nyati, 1988). Technical and financial issues are problems that can be handled internally, but external problems such as legislative and regulatory compliance are more problematic. This paper will discuss the importance of industrialization, the role of small industries, their importance in a country like India, and problems they encounter. Finally, India's major problem-population-and its relationship with the environment will be discussed. This article seeks to shed some light on small manufacturing industries and their environmental performance. An attempt is made to address some solutions that can improve environmental quality within these small industries by focusing on a sustainable vision-i.e. a trade-off between economic growth, profitability, and sustainable environment.

Why is industrialization important in India?

Industrialization is the central dynamic force for most countries. It has been a key growth objective of India's planned economy, with heavy investments being made in this sector. Labour productivity is highest in manufacturing industries; this has assisted in raising national income at a faster pace. It is a precondition for agricultural development and it induces development in other sectors (Tiwary & Singh, 1990). The importance of industrialization in economic development is crucial for a growing economy with a large population like India, so 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 to grow unabated. Being reliant on agriculture and having a large population base has made India impoverished, and hence industrialization is roughly a synonym for economic development as a means to conquer poverty and provide employment.

India's increasing population crossed the 1 billion mark in May 2000 (Vedantam, 2000) placing an additional burden on the Indian environment. The contrast between India's successful economic development and rapidly deteriorating environments, particularly urban-industrial environments, makes this country a test for the sustainable vision.

India's focus on growth witnessed two problems. One is population and the other industrialisation. India realised that in order to become more self-reliant and increase economic growth some changes had to be made. During the 1980s India moved away from its planned market, emphasising industry growth. Its economy grew at about 5.5% annually. Prior to those years there was a 3.5% growth and recently it has been about

6%, although 8-9% growth is required for the 10 million new jobs needed each year (United States-Asia Environmental Partnership [US-AEP], 1996).

Industrialization enables India to utilize its resources optimally, diversify the economic base, raise the living standard of people, and attain balanced regional development through fiscal incentives and concessional finance for backward regions. At the same time industries contribute significantly to pollution. Small industries have contributed significantly in the area of urban as well as rural establishments. Raising concerns on environmental grounds are seen not so much as a problem with large industries, as they are more supportive of environmentally protective issues, but more so in the case of small industries. These small industries seem to have acute environmental problems.

Role and Problems of Small Units in India

As industrialisation gathered momentum so did the increase in small-scale industries. Small units play an important role in the Indian economy, as they are labour intensive and create job opportunities. Small companies are defined as those with less than US \$180,000 in capital equipment (US-AEP, 1996). They offer a higher productivity of capital than capital intensive enterprises, as they have low investment per worker. They help in dispersal of industries, rural development, and the decentralisation of economic power. All this is required to increase and disperse economic growth.

In addition, small companies support entrepreneurial talent and skills, stimulate personal savings, and help in developing innovative and appropriate indigenous technology, providing dynamism and contributing to competition (Rajendran, 1989). Therefore these industries are supported by the government and have been actively encouraged; no public or private enterprise with more than 100 employees has been allowed to go out of business (US-AEP, 1996). Several policy initiatives and procedural simplifications have been undertaken by the government to support this sector, not only for employment generation but also to enhance their competitive strength. The government has also provided measures such as greater infra-structural support, more and easier availability of credit, lower rates of duty, technology up-gradation, assistance to build entrepreneurial talent, facilities for quality improvement, and export incentives (Parthasarathy, 1996).

Contributions of small-scale industries (SSIs) to India's industrial production, exports, and employment are significant. About 3 million SSI units employing nearly 16.7 million persons account for 35% of India's total exports and about 40% of industrial manufacture (SIDBI report on small

scale industries sector, 1999, 1999, p. 6). 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. By the year 2025, if not controlled, this sector will grow even more rapidly (Parthasarathy, 1996).

The government's prime role has been to encourage growth of these industries, often neglecting environmental considerations. Industrial effluent largely comes from the 3 million small- and medium-sized units that are scattered throughout the country, particularly in the production of paper, sugar, leather, and chemicals. Unfortunately, only about half the medium- to large-scale industries have partial or complete effluent treatment. Fourfold industrial growth from 1963 to 1991 resulted in sixfold growth in toxic releases. Heavy industries like iron and steel producers contribute nearly 70% of the toxic wastes released 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).

Besides pollution problems, small-scale industries also have other kinds of problems. One is internal, that is, the techno-managerial and financial problems that they encounter, and the other is the external problems that they confront due to non-compliance with regulatory and legislative measures.

Techno-Managerial and Financial Problems

Small industries by comparison with large industries lack environmental commitment, technical expertise in environmental management, and the financial capabilities to address environmental problems. Nor do they have standards or effective treatment opportunities and services (Nyati, 1988). Interestingly, one would imagine that because small industries are heavily supported by the government, availability of finance and obtaining finance for pollution control measures should not be a problem.

Small industries also lack additional space for pollution control facilities. There are difficulties in obtaining the technical assistance of knowledgeable consultants. Since most of the units are dispersed, they find it difficult to come together for a joint or common treatment plant. The concern of depressed profit margins and decline in competitiveness prevents these units from using pollution control measures. More emphasis is laid on new investments, production, and other return oriented opportunities. Soft loans for pollution control measures are not lucrative. There are subsidies offered for investments in pollution control as incentives, but the impact of these incentives on these units is little or nothing, for they do not alter the

cost-benefit analysis in favour of pollution control investments (Nyati, 1988).

Regulatory Problems

Research done by Pargal, Mani, and Huq (1997) on industrial plants in India, indicated that high levels of pollution elicit a formal regulatory response in the form of inspections, but these inspections appear to have no impact on the emissions. Inspections are probably ineffective in bringing about desired changes in behaviour because of bureaucratic or other problems, including the probability that enforcement is low and that the penalty for non-compliance is not stringent enough to act as a deterrent. They suggest that Indian policy makers and regulators thus need to explicitly recognize the trade-off in environmental quality of the existing regulatory bias towards the small- and medium-scale sector.

Regulatory compliance has been a major issue for these units.

Environmental legislation in India, although seemingly as tough as that in major developed nations, is not well enforced. Though multinationals and the large domestic companies are monitored, poorly funded regulatory bodies find it nearly impossible to police the millions of small- and medium-scale units. Bribing poorly paid inspectors is reported to be common (Roberts, 1995).

Environmentalists have viewed enforcement as lax, despite the regulatory framework and oversight authority of the Central and State Boards. There have been no incentives to invest in the pollution control effort because of weak monitoring and enforcement of environmental regulations. It is mainly small industries that continue to lack incentives to set up treatment equipment or to operate equipment, if it already is installed, because operating that equipment has been more expensive than non-compliance (Dasgupta, Laplante, & Mamingi, 1998). Obviously, in India, scarcity of natural resources is less a concern than misuse of them. The pressure for profits predominates. Porter and Linde's (1995) suggestion that environmental regulations can spur innovations that increase product value and decrease total costs seems appropriate. The trade-off between economy and environment for production processes, customer needs, and technology is dynamic and complex. Porter and Linde suggest that innovation-friendly regulations can improve resource productivity and competitiveness, but the problem is getting small industries to co-operate and to view it as a long-term solution rather than a short-term goal.

Environmental Pollution Laws

India began to develop distinctive forms of environmental laws and

regulations in the 1970s. 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 Water Cess Act of 1977; 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 central government. The problem envisaged here is not insufficient laws or pollution control boards that can control pollution but, as the World Bank has stated, that these boards have been plagued "by poor enforcement due to political interference . . . whereas 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 in India, 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 so is the responsibility of the SPCBs (Mani, Pargal, & Huq, 1996). This is another haphazard method of addressing the issue.

In addition, pollution laws have achieved little success. The courts have been slow to respond to enforcement actions sought by state pollution boards. The boards themselves have been poorly funded and charges of corruption have been regular and widespread. Large industries have achieved pollution compliance more easily than small industries (US-AEP, 1996). The reason is that they are afraid of taking risks. Lau and Srinivasan's (1997) research on identifying the driving force for better environmental performance found results that implied the current effort in environmental management is driven largely by a fear of the penalty that can be imposed by the government when environmental laws are violated. However, Cornell and Shapiro (1987) explained that a firm's value depended on the cost of explicit and implicit environmental claims. Explicit claims of the shareholders can be recognized, but the implicit claims of the firm cannot be ignored. If the firm refuses to comply with its social responsibility and quality service, parties to implicit contracts, like consumers or regulatory agencies, can force burdensome explicit contracts on the firm. Cornell and Shapiro's explanation applies widely to large industries, but in the case of small firms it is apparent from the literature above that this can be totally dismissed by resorting to other means.

Population versus Environmentalism

Lastly, population issues are a major growing problem in India. To sustain this growth, economic development and industrialization are the

compounding factors that are an environmental burden. An approach first used by Ehrlich and Ehrlich (1990, pp. 132-134) was to consider per capita environmental impacts on citizens. Their notion of the realization that we live in a finite world in which euphoric economic growth and population expansion would eventually exhaust the natural resources was not met without controversy. Stikker (1992) further expanded Ehrlich and Ehrlich's approach and defined the environmental burden as:

Global environmental burden = global population x GNP per capita x Environmental impact per unit of GNP

If one considers population, GNP, and environmental impact per unit of GNP, India, with an annual population growth of 1.91%, increases every year by the size of the population of some countries in Europe. India's population doubled in the last 30 years and is expected to surpass China's population early in the 21st century (US-AEP, 1996). On an individualistic approach, if one considers individual country populations, India and China would be the countries with the highest burden. What Stikker, and Ehrlich and Ehrlich suggest is that if industry is to operate within a level of global environmental quality that is not deteriorating, it must reduce its global environmental impact. Peattie's (1995, pp. 1-15) suggestion regarding the concern generated by the Ehrlichs and Stikker concentrated on the issues of shortages of economically important resource inputs. The problems that emerged in the 1980s were not concerned with the inputs but dealt more with the environmental impact of the outputs due to indiscriminate economic growth.

Resources will be required to sustain population growth, as well as the outputs of industrialization and economic growth. Said (1997) provides two logical solutions to the Erlichs' theory, one is that humanity should breed less and the other is that we should consume less and produce lower environmental impacts in the process. Changing lifestyle and consumption habits in the long run will be effective but will not directly address environmental impact unless industries themselves take the stance and priority of protecting the environment and measures are enforced to curb population growth.

Conclusions and Discussions

The major environmental concerns in India today are poverty coupled with growing population and the side effects of enhanced industrial activities. As long as poverty remains the main stumbling block, industrialization provides hope of significantly improving the standard of living. One of the measures most talked about that might gain recognition within these industries is

sustainable development. Removal of poverty and environmental protection are two sides of the same coin that is sustainable development (Dwivedi & Khator, 1995), but policy makers, governments, politicians, and industrialists have challenged many of the underlying values and assumptions of sustainability. Sustainability or sustainable development can also be described as development or progress that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Although, industrialization is seen as a solution to providing economic growth and increasing employment levels, irrespectively, industries, whether large or small, low-tech or hi-tech, manufacturing or agricultural, all inevitably produce discharges and wastes that are capable of polluting. Where high population and economic growth demands resources (inputs) and discharges (outputs) in the form of pollutants, not many industries have arrived at suitable suggestions on sustainable measures, thus putting pressure on the environment. Hart (1997), in fact, recognised the problem of a growing population, rapid economic development in emerging economies, and political and social issues that exceed the mandate and the capabilities of any corporation. However, the suggestion that learning to balance ecological principles, economic growth, and social responsibility be priorities of businesses (Johannson, 1994) does eventually make more sense. Sustainable development challenges industry to produce high levels of output while using lower levels of inputs and generating less wastes with a more effective use of raw materials in production that would eventually result in diminishing costs. This greener corporate image could then lead to an increased market share (Welford & Bhargava, 1996). Hart (1997) states that the business logic for greening has been largely operational or technical, and bottom up pollution prevention programs have saved billions of dollars, but few have realised that environmental opportunities might actually become a major source of revenue growth. The suggestion made by Hart, and the concept of sustainable development should, in fact, be made the core objective within the operations of small industries.

Small industries could also go one step further in addressing a sustainable vision i.e. a trade-off between economic growth, profitability, and sustainable environment. Within industries, management should be charged with the responsibility of implementing this concept of the sustainable vision into action by firms. One such measure is Johannson's (1994) trisect of sustainable business. It is founded on the concept of balancing ecology, economic, and social factors that are included in the industry's value system, and included in the business planning or design phase resulting in profits through ecologically sound products, processes, or services. In a complex

relationship between population, economy, industry, and ecology, managing the environmental responsibility is a prime issue in India. Population will always be a problem if not properly curtailed, but in the case of industrialization there is a growing need for a sustainable vision where industries are made responsible for their acts. With today's current technology and strategic management systems, industries can be effective in reducing the gravity of environmental impacts. The green challenge is an issue that is relevant to every industry big or small. Every business faces pressure to improve its eco-performance.

As regards regulatory pressure and compliance, many businesses spend more time in fighting regulations and take a less proactive, strategic approach to environmental management (Schoemaker and Schoemaker, 1995). Although Indian courts closed almost 1,000 factories for pollution problems, and the Supreme Court fined 15 plants, including some multinationals (Shaman, 1996), the effectiveness of these regulatory pressures and compliance has still to be realized. Johannson (1994) addresses a "green firm" as one that does not look at regulatory or legal compliance as a first step. The ability to assure that a firm is "in compliance" is therefore a poor tactic, and very cost-ineffective. Managers who understand environmental laws can be counted on. In other words, regulation, compliance, and environmental laws will take care of themselves if managers adopt a sustainable vision or green objectives for industries. Much of the literature seeks to establish that there is an acute need for regulatory and legal measures. However, pressure for sustainable vision in these small industries lies within themselves. They must realize the importance of environmental management and quality and that it could be highly effective if it is administered by the small units themselves.

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